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## THE LATE JOS. D. WEEKS.

Mr. Joseph D. Weeks, editor and proprietor of the American Manufacturer, born December 3, 1840, passed away very suddenly last week while in harness and attending to the duties of editing his paper.

The amount of labor which Mr. Weeks crowded into his life was remarkable. He apparently never had an idle moment. The work which passed through his hands and which is shown in type, was sufficient to occupy a long lifetime; but in addition to this he did a great deal, of which little record is now seen. His keen analytical mind, and the ease and directness with which he reacehed the very root of any matter presented, made him especially efficient at getting through business intricacies. His attainments in the lines to which he devoted his life, were recognized the world over,and he was called to membership in the leading technical societies in Europe, including the British Iron and Steel institute, of which he was elected a member in 1878. He was also elected president of the American Institute of Mining Engineers in 1895.

Mr. Weeks, with his varied training and marked faculty for getting at facts, was well calculated for statistical work. His efficiency in this line was recognized by the government, and he was called to work upon the United States Census of 1880. For this he prepared the facts entitled, "The Manufacture of Coke," and "The Manufacture of Glass." In addition to this he presented the entire volume XX of the census of 1880, which was "Statistics of Wages in Manufacturing Industries, with Supplemental Report on Strikes, Lockouts, and Trade Societies." In 1885 he began his work of the U. S. Geological Survey, in his reports which make a part of the yearly volume of "Mineral Statistics," on "The Manufacture of Coke," Production of Crude Petroleum," "Natural Gas," and "The Production of Magnese." These subjects he has handled ever since, preparing a report on each annually. For the Census of 1890 he prepared statistics of the branches with which he was so well acquainted, under the Department of Mines and Mining three reports—Crude Petroleum, Natural Gas, and Maganese, and in the Department of Manufactures three reports—Coke, Glass and a work on Petroleum Refining, the latter being the first of its kind ever published by the government. Mr. Weeks was the first to see the possibilities of natural gas as a fuel, and early he began to collect the statistics which form the principal record of that remarkable development. In 1874 he made a series of experiments in iron manufacture at the mill of Rogers & Burchfield, Leechburg, Pa., which was the first mill to use natural gas in a puddling furnace.

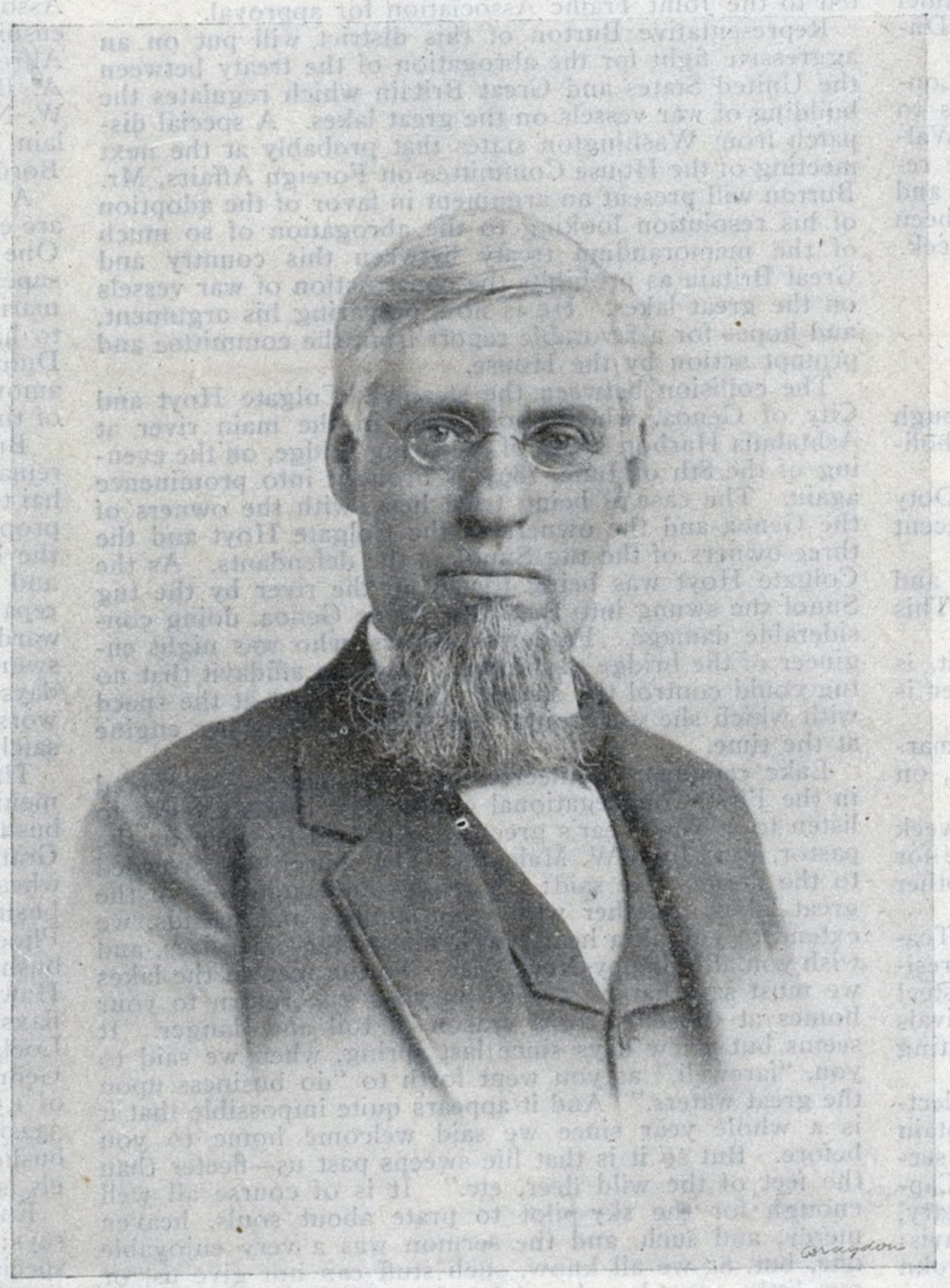
Mr. Weeks took quite an interest in fraternal organizations. He was an early member of the Knights of Pythias, and was Past Grand Chancelor of Iowa. In 1874 he wrote a "History of the Knight of Pythias," which was the first account of the organization. He was a thirty-third-degree Mason of the Ancient Scottish Rites, having joined the Masonic order when quite a young man. He was a member of the Duquesne Club and the Junta of Pittsburg.

## A RIVER OBSTRUCTION.

Certain marine interests are making a vigorous protest against a plan of the St. Joe Valley Railroad Company to build a bridge across the navigable waters of the river at St. Joseph, Mich. The company has not obtained the consent of the Secretary of War, and the proposed bridge is said to be quite certain to impede navigation. It is now understood that Secretary Lamont will instruct the government engineers to investigate the subject and ascertain the facts before the bridge work be allowed to proceed.

## MUSKEGON RANGE LIGHTS.

Judging from a special from Muskegon, Mich., the winter traffic into that port is somewhat dissatisfied over the discontinuance by the government of the range lights which mark the entrance to the channel from the inner harbor. The lights burn all summer and are needed equally as much in winter, if not more so. The Petoskey grounded one night recently, her pilot having been accustomed to the lights and being deceived when they did not show up. There is no doubt that when the proper representations are made to the Light House Board through the officer in charge of the district, but that the range lights will be exhibited whenever and at all times, when the commerce of the port requires them to be burning.



(THE LATE) JOSEPH D. WEEKS.

## SEASON BUSINESS AT MENOMINEE.

The number of arrivals and clearances at the ports of Menominee and Marinette for the past season were 1,333, with a total tonnage of 355,529, of which Menominee had 763 entries, 186,725 tonnage; Marinette, 570 entries, tonnage 168,004. The first arrival in Menominee was on April 16 and the last on December 21.

## TO DESTROY DERELICTS.

For a considerable time the Hydrographic Office of the Navy Department has been agitating the subject of international action with England toward some plan for the location and removal of floating derelicts on the lines of transatlantic steamers. Present indications point to an early realization of such a plan. A bill is to be introduced in the next Parliament by one of the chief advocates of the subject in England, which will authorize appropriations for constructing vessels to search for and destroy derelicts and other impediments to navigation on the principal transoceanic routes, and for the supply of ordinary merchant vessels with dynamite cartridges to blow up any wreckage. The bill will empower British consuls to pay ship money of from £10 to £50 to captains who destroy such wreckage, and a bounty of £1 to each seaman who shall engage in such work. The passage of the bill will have the support of many officers of the Royal Navy, in a committee of which Lieut. A. G. Froud, R. N., will be the active leader, backed by the Admiralty, the British Board of Trade, the Lighthouse Service, Lloyds and the Shipmasters' Association, a petition of 1,100 British shipowners and the editorial support of many papers. Friends of the bill are confident of its passage. The Hydrographic Office of the U. S. Navy, which took the initiative in the matter, is pledged to support the measure on this side, and will use its instrumentality to have a bill introduced in Congress providing for similar action in this country to that likely to be soon taken in England.

## PROGRESS OF TRANSPORTATION.

In a retrospect of engineering and relative progress made in what is broadly designated as the Victorian era, dating from 1847 to the time of review, some very interesting data was given at the seventy-eighth session of the institute of civil engineers, recently held in Great Britain. The same period includes the most notable advances made along the same lines in all countries that have been susceptible to the spur of material and moral progress. This gives the presidential address of Mr. Wolfe Barry a much more than merely insular interest.

In ocean transportation a wonderful progress has been placed on record. An American ship, with small auxiliary engines, in the year 1819, had crossed the Atlantic in about thirty days, but that a voyage of like distance could be made by any vessel entirely or mainly dependent on steam was by the wise men of 1837 considered an impossibility. The modern ocean greyhound can accomplish the same journey in a fraction of time over five days by steamer of 12,000 tons, and with engines of 30,000 horse power. In the matter of submarine telegraphy there was no cable across the Channel till 1851, nor to the United States till 1858. The mileage of 1896 amounted to 162,000 miles; the capital employed amounted to forty millions sterling, and the number of telegrams sent or received annually, independent of the postoffice intervention, averaged 7,000,000.

It is stated that the British admiralty intends to introduce a new class of torpedo destroyers of a minimum speed of thirty-three knots. Twenty vessels, it seems, will be ordered immediately of this class.

# NEWS AROUND THE LAKES.

## CHICAGO.

Special Correspondence to Marine Record.

Winter weather commenced here Monday, with a snow storm, which followed several days of soaking rain.

The steamer Lewiston will be towed to South Chicago by the Dunham Towing & Wrecking Company this week.

The Goodrich Companys steamer Iowa is expected here this week to take the place of the company's steamer City of Racine, which went to Manitowoc to lay up last week.

C. W. Elphicke & Co. chartered the steamer George Stone for 105,000 bushels of oats at 2¼ cents for winter storage and delivery at Buffalo in the spring.

The many friends of Capt. Frank Higgie, who has been laid up at his home during the past three weeks, from a severe attack of bronchitis, are pleased to know that he is improving daily and hopes soon to be down attending to business again.

Cyrus H. Sinclair returned here from Toledo Sunday, where he had been making, with Capt. M. Mulholland, a survey of the steamer J. S. Fay, in dry-dock at Craig & Sons shipyard. He reports the Fays bottom badly used up from stem to stern and from bilge to bilge, stem, stem post, rudder and propeller wheel gone.

At a meeting of the American Association of Masters and Pilots, Chicago Harbor No. 33, held at their lodge on Wednesday last, the following officers were chosen for 1897: Capt. John Jenks, captain; Joseph DeCoudres, first pilot; William Brown, second pilot; J. W. Bryon, purser; George Tebo, captains clerk; John Jenks, delegate to Washington; J. O. Woods, alternate delegate to Washington.

At the Chicago Shipbuilding Companys shipyard the steamer Yuma is in dock for several new plates on her bottom. The steamer Lewiston will follow the Yuma, and will be lengthened about 50 feet amidships and will receive new steel deck frames and upper deck. The steamer Crescent City, building for the Wolrin syndicate of Duluth, will be launched the latter part of this month.

At Miller Brothers shipyard the steamer City of London is in dock receiving a new shoe, some repairs to sail and some caulking. The steam lighter Albert Wallace is in dock having her shaft straightened, some repairs to her stern bearing and shoe, some repairs and caulking. The schooner C. J. Magill, which has been receiving extensive repairs, will go out of dock this week.

## PORT HURON.

Special correspondence to the Marine Record.

Marine business is very dull here just now, although things are expected to brighten up some after the holidays.

Captain Chis Smith has taken the steamer L. R. Doty from Chicago to Milwaukee, and will repair her recent fire damage at that port.

Thompson & Boynton have purchased a new hull, and will put the burned tug Crusader's engines in her. This will make her a powerful boat.

An electric railway, between this port and Detroit, is to be completed by November next, or the promoter is to lose his bond and franchise.

Captain A. B. Slyfield and Miss May Cutler were married at the residence of Rev. Dr. Thompson, Sarnia, on Wednesday evening, December 30.

The Jenks Shipbuilding Company will start this week with a full force of men to build a large steam barge for the copper trade. I will forward her dimensions and other particulars for the next issue of the Record.

A permit has been issued to Schofield, Shurmer & Teagle, proprietors of the Great Western Oil works and residents of Cleveland to build a large warehouse and steel tanks for oil storage purposes. The company are rivals of the Standard, and intend making this their distributing point for eastern Michigan.

The Port Huron lodge of Shipmasters Association elected the following officers on Saturday: President, Captain W. E. Rice; first vice president, Captain H. Zealand; second vice president, Captain G. W. Pierce; chaplain, Captain Chas. W. Black; financial and recording secretary, Captain M. A. Budd; treasurer, Captain Henry Davis; marshal, Captain Harry Maitland; warden, Captain John Bradshaw, and sentinel, Captain Wm. J. Cowles.

## CLEVELAND.

Special Correspondence to the Marine Record.

Repairs are being made upon the steel steamer Pioneer.

Capt. Horace Fisher and Miss Nettie Goucher of Vermillion were married at Sandusky on Wednesday.

I learn through Captain Benham that a ball will be given by the local Harbor of Shipmasters and Pilots at Army and Navy Hall on January 19.

Capt. Henry Stone, who sailed the passenger steamer North Land last season, has severed his connection with the Northern Steamship company.

The steamer Aurora, whose arrival at Buffalo on Saturday was announced by telegraph, suffered a great delay while en route from Toledo on account of ice and fog. She is to return, and if weather conditions continue favorable may make another trip from Toledo with corn. The Aurora goes on record as having delivered grain at Buffalo later in the season than at any previous time in the history of lake navigation.

I was pleased to meet Captain Perkins this week, a down-east man who is trying to combine shipmasters and pilots on the lakes in a Harbor organization for mutual benefit. His plan seems to succeed admirably.

Mayor McKisson, who is perhaps destined to become president of the United States some time in the future, said, Tuesday, that the city would advertise for bids on the improvement of the river at once. "Inside of three months,, at the most," he said, "I expect to see the work under full headway. Re garding the Pennsylvania Co., I have only to say that there need be no fear on that score. The city will get possession of the property by appropriation proceedings." And so goes on the improvement of our harbor and its approaches.

H. D. Goulder is mentioned for the presidency of the Lake Carriers' Association, though it is not likely that he would accept the position. As is not usually the case, no person who as yet has been mentioned, seems to have any particular strength. There is complaint about the expenses of the association, and some of the small owners would like to see assessments on large modern tonnage higher than the charge against small tonnage. When Mr. Goulder was in Buffalo last wek he gave it as his opinion that Captain J. W. Millen would be asked to take the place of president of the association.

Another meeting of the Lake Line Association, which embraces nearly all the steamboat lines that ply on the lakes, was held in New York this week. The chairman of the meeting said that the question of the apportionment of business and an agreement with the railroads would doubtless be further discussed. Efforts will be made to effect an agreement of two or more years' duration, and that will carry with it the co-operation of the Joint Traffic Association, which a few weeks ago made overtures in that direction to the Lake Lines Association. Whatever agreement may be formulated will be submitted to the Joint Traffic Association for approval.

Representative Burton of this district will put on an aggressive fight for the abrogation of the treaty between the United States and Great Britain which regulates the building of war vessels on the great lakes. A special dispatch from Washington states that probably at the next meeting of the House Committee on Foreign Affairs, Mr. Burton will present an argument in favor of the adoption of his resolution looking to the abrogation of so much of the memorandum treaty between this country and Great Britain as prohibits the construction of war vessels on the great lakes. He is now preparing his argument, and hopes for a favorable report from the committee and prompt action by the House.

The collision between the steamers Colgate Hoyt and City of Genoa, which took place in the main river at Ashtabula Harbor, south of the swing bridge, on the evening of the 8th of June, 1894, is brought into prominence again. The case is being tried here, with the owners of the Genoa and the owners of the Colgate Hoyt and the three owners of the tug Sunol as the defendants. As the Colgate Hoyt was being towed up the river by the tug Sunol she swung into the stern of the Genoa, doing considerable damage. Frederick Rivers, who was night engineer of the bridge at the time, made an affidavit that no tug could control the steamer Colgate Hoyt at the speed with which she was going, the Hoyt working her engine at the time.

Lake captains, engineers and other mariners gathered in the First Congregational church last Sunday night to listen to a New Year's greeting extended to them by the pastor, Rev. John W. Malcolm. The church was crowded to the doors. He said: "Captains and engineers of the great lakes, together with your families and friends, we extend to you all a hearty welcome to these services, and wish you all a happy New Year. To the men of the lakes we must say that we rejoice in your safe return to your homes at the close of a season of toil and danger. It seems but a few days since last spring, when we said to you, "farewell," as you went forth to "do business upon the great waters." And it appears quite impossible that it is a whole year since we said welcome home to you before. But so it is that life sweeps past us—fleeter than the feet of the wild deer, etc." It is of course all well enough for the sky-pilot to prate about souls, heaven mercy, and such, and the sermon was a very enjoyable one, but, as we all know, such stuff can not give us, or our little ones, bread and butter. There is no question about a sailor's life, he takes all that he can below and they will perhaps treat him decent aloft?.

The big steamer which the Cleveland Shipbuilding Co. will build for A. B. Wolvin, of Duluth, will be named Empire City. Mr. Wolvin will then have the Queen City, Zenith City, Crescent City and Empire City. The Queen City and Zenith City were in commission last season. The first named boat was built by the Cleveland Shipbuilding Co., and is one of the best business boats on the lakes, and the Zenith was built in Chicago, where the Crescent City is now building. Anent the attempt being made by Lorain to induce the Cleveland Shipbuilding Co. to move to that place, Vice-President and Manager James Wallace says that the offer made was too small to be effective. Lorain has been trying to secure the works for several years, but the company is satisfied to remain in Cleveland, the present location being a good one and probably satisfactory. A good offer, however, might induce the company to move, but as Lorain only wants to give $20,000, and considers that a good offer the works will remain in Cleveland.

It appears that the Harbors of masters and pilots are gaining ground on the lakes. Already there are nine associations on the lakes, and several more are contemplating the connection. The membership now is between six and seven hundred, and I learn that a harbor will soon be established at Milwaukee; that is, if Captain George Tebo, district deputy grand captain, can corral the boys in time. Furthermore, the Shipmasters Association is to meet in Washington on the 19th. The Harbor organization was to meet on the 25th inst., and learning this the Harbor officers will endeavor to alter their meeting arrangements to the 18th inst., so that both organizations may be in Washington together and work for the mutual advantage of each other. The election of officers here, which is No. 42 in their category, shows Captain C. A. Benham, first pilot, Frank Place; second pilot, Samuel Allen; purser, C. E. Benham; captain's clerk, Lee Brogan. The subordinate officers will be appointed by the captain of the order at the next meeting.

## FLOTSAM, JETSAM AND LAGAN.

Milwaukee people, or rather those who frequent the port, don't like the light on the north point of the bay. It is now a white flash and the electric lights sort of mix sailors up. They now ask for a red flash, or some more distinguishing light than the present white light.

The steamer City of Kalamazoo, which was burned at South Haven November 30, will be rebuilt there at once. The work of tearing out the burned wood has been commenced. It is expected that she will be rebuilt on the old model, but greatly improved and made more speedy.

The Chicago Lumbering Co. won its suit against Tug-owner Adam Hartman, of Tonawanda, getting a verdict of $3,400. The claim was one of Hartman's tugs set fire to a pile of lumber belonging to the company. The case was a very peculiar one, and the trial lasted about a week.

At Menominee the Marine Engineers' Benevolent Association met and elected officers as follows for the ensuing year: Past president, N. A. Scofield; president, Alfred Lamson; vice president, Chas. Hanson; treasurer, A. Bruce; secretary, N. A. Scofield; financial secretary, W. N. Casson; recording secretary, Alfred Larson; chaplain, W. H. Farr; conductor, J. Leaf; doorkeeper, F. Bordwell.

A number of changes in the Northern Steamship line are expected before the opening of navigation next spring. One of them is the appointment of Engineer Brodie as superintendent of repairs, which will include the office of marine superindentent. This change is unofficially said to have been made already. Brodie will be stationed at Duluth and will have an assistant at Buffalo. There is any amount of gossip as to changes in masters of the steamers of the line.

British turreted whaleback steamer Oak Branch had a remarkable experienc reecently on a voyage from Shanghai to Sydney, in water ballast. The big steamer lost her propeller and shaft in midocean, and lay helpless in not the best of weather. There was an additional propeller and shaft aboard, and her engineer set about to make repairs. The ballast after was pumped out and the forward tanks filled. Then the extra shaft and propeller was swung over and fitted into place. The job required eight days, during which the weather was bad and the sharks worse. The steamer proceeded on her voyage, arriving safely at Sydney.

The following vessels will hold grain at Buffalo: Armenia, 225,689 bushels flaxseed; Rappahannock, 98,000 bushels flaxseed; Appomattox, 105,500 bushels flaxseed; Granada, 95,300 bushels flaxseed; Nyanza, 40,000 bushels wheat; G. W. Roby, 24,421 bushels barley, and 56,000 bushels of wheat; V. H. Ketchum, 50,000 bushels wheat; Phoenix, 81,550 bushels baley; G. F. Williams, 85,057 bushels wheat; T. Maytham, 110,000 bushels corn; H. A. Hawgood, 100,000 bushels oats; Progress, 68,500 bushels flaxseed; J. C. Fitzpatrick, 87,000 bushels corn; C. B. Lockwood, 95,000 bushels rye, 118,101 bushels wheat; George Spencer, 66,767 bushels flaxseed. This is a total of 1,514,484 bushels, of which 683,956 bushels is flaxseed, 332,057 bushels is wheat, 197,500 bushels is corn, 165,971 bushels is barley, 100,000 bushels is oats and 95,000 bushels is rye.

Engineer-in-Chief George W. Melville of the Navy, says: "The trial of the Brooklyn, U. S. N., is worthy of special mention, on account of the fact that she is the first vessel tried that has been fitted with tall smoke pipes. The results obtained on the official trial give every promise that the fitting of these tall smoke pipes will be attended with economy, and that the Brooklyn will be able to steam continuously at a satisfactory speed without having to use her forced draft blowers."

As usual when we quote from local dailies, we are generally called down, or in other words, get left. A special edition of the Detroit Free Press, issued last week, attempted to give some particulars of the Detroit Dry Dock Company. The article read well, and though we knew it was in error, it was printed verbatim with due credit in our issue of December 31st. The big Michigan daily incorporated the above company in 1892, although we know that 1872 is nearer the mark, and again, the capital is $600,000. The president of the company is Mr. Hugh McMillan, A. McVittie is vice president and general manager, Frank E. Kirby, engineer, and G. N. McMillan secretary and treasurer.

## BUFFALO INJURING HERSELF.

Few people connected with lake shipping have any idea of the enormous competition that the lake route has been meeting with of late years in the export flour and grain trade from such Southern ports as New Orleans, Galveston and Newport News. Buffalo's elevator monopoly, with its high transfer charges, is one of the prime causes of this trade being diverted from the lakes, says the Marine Record. It would not take much to stir up a disturbance on this score at the coming meeting of the Lake Carriers' Association. The plan of having New York State take over and operate the grain elevators is undoubtedly objectionable in principle, but lake vesselmen have been giving considerable attention to the subject since a bill with that end in view was introduced in the New York State Legislature some time gao, and they may be heard from later on.

Where are the growing cities of the middle West located? Where lake transportation is available. Cleveland is outstripping Cincinnati. Buffalo is the most thriving city in the Empire State beside New York. Detroit, Milwaukee, Duluth and a score of smaller places have made wonderful strides, and are outstripping their rivals which have not the advantage of cheap water transportation. Chicago escaped the threatened and anticipated collapse after the World's Columbian exposition, and the recent election in that city showed that its population had made a remarkable gain. There can be but one cause for this great advance in all lake cities, and that cause is the advantage cheap water transportation gives them.—Duluth News-Tribune.

## THE ALMY WATER TUBE BOILER.

The report upon the evaporative trials of an Almy Water Tube Boiler, made by George H. Barrus, Esq., of Boston, has just been completed. The data and results of the tests are given in the accompanying tables, of which table No. 1 relates to the general use and results, and table No. 2 to the heat balance:

TABLE NO. 1.

DATA AND RESULTS OF EVAPORATIVE TESTS ON ALMY WATER TUBE BOILER AT PROVIDENCE, R. I.

Grate Surface, 11 38 sq. ft.; Heating Surface, 474 sq. ft.

| Kind of coal—George's Creek Cumberland. | | | | |
|---|---|---|---|---|
| Per cent. of moisture in coal.. | 2.4 | 1.8 | 1.8 | 1.8 |
| Conditions as to capacity..... | Normal. | Normal. | Forced Draft 1-Heavy. 2-Medium. | |
| Date of Test—1896..... | Oct. 31. | Nov. 2 | Nov. 2. | Nov 2. |
| TOTAL QUANTITIES. | | | | |
| 1. Duration, hrs..... | 9.15 | 6.1 | 2.03 | 2.0 |
| 2. Weight of dry coal consumed, lbs ..... | 1,274. | 971. | 831. | 543. |
| 3. Weight of ashes and clinkers, lbs..... | 110. | 100. | ..... | ..... |
| 4. Per cent. of ashes and clinkers, per ce t..... | 8.6 | 10.3 | ..... | ..... |
| 5. Weight of water evaporated ..... | 11,332. | 8,610. | 6,560. | 4,414. |
| HOURLY QUANTITIES. | | | | |
| 6. Coal consumed per hour lbs..... | 139.2 | 159.2 | 409.4 | 271.5 |
| 7. Coal consumed per hour, per sq ft of grate, lbs | 12.2 | 13.99 | 35.98 | 23.86 |
| 8. Water evaporated per hour. lbs..... | 1,238.5 | 1,403.6 | 3,231. | 2,207. |
| 9. Equiv. evap. per hour. feed 100 deg., pressure 70 lbs., lbs. ..... | 1,300.4 | 1,472.8 | 3,389.3 | 2,315.1 |
| 10. Horse power developed on basis of 30 lbs., H. P... | 43.3 | 49.1 | 112.98 | 77.2 |
| 11. Equiv. evap. per sq. ft heating surface per hour lbs..... | 2.74 | 3.1 | 7.15 | 4.88 |
| AVERAGES OF OBSERVATIONS. | | | | |
| 12. Average boiler pressure, lbs..... | 147.1 | 146.8 | 153.6 | 140.1 |
| 13. Average temperature of feed water, deg..... | 56.7 | 56.6 | 56. | 56. |
| 14. Average temperature of flue gases deg..... | 513. | 473. | 850.* | 715.* |
| 15. Average draught suction in.. ..... | .12 | .14 | .71 | 4. |
| 16. Per cent of moisture in steam..... | 0.35 | 0.4 | 0.72 | 0.42 |
| 17 Weather and outside temperature..... | Clear. Warm | Clear. Moderate | ..... | ..... |
| 18. Total heat of combustion per lb of dry coal. B. T U..... | ..... | 14,168. | ..... | ..... |
| 19. Total heat of combustion per lb. combustible B. T. U..... | ** | 15,186. | ..... | ..... |
| RESULTS. | | | | |
| 20. Water evap. per lb. of coal, lbs..... | 8.895 | 8.867 | 7.894 | 8.129 |
| 21. Equiv. evap. per lb. of coal from and at 212 deg., lbs..... | 10.736 | 10.694 | ..... | ..... |
| 22. Equiv evap per lb comb. from and at 212 deg., lbs..... | 11.746 | 11.922 | ..... | ..... |
| 23. Efficiency on combustible per cent..... | ..... | 75.8 | ..... | ..... |

*Only one observation. The actual temperature on the heavy forced draft test was higher than 850 deg, the limit of the thermometer used, probably 900 deg.

**See Table No. 2 for heat of combustion computed from analysis.

TABLE NO. 2 (a).

RESULTS OF GAS ANALYSIS GIVEN IN PERCENTAGES BY VOLUME.

| Date, Etc. | Oct. 31. Averages for whole test. | Nov. 2. One hour of main test. | No. 2, Forced Draft Tests | |
|---|---|---|---|---|
| | | | 1 | 2 |
| Carbonic Acid $CO_2$ | 13.1 | 10.7 | 13.4 | 12.0 |
| Carbonic Oxide $CO^2$ | 0.9 | 2.8 | 1.9 | 0.7 |
| Oxygen, $O_2$ | 4.8 | 5.4 | 3.1 | 5.8 |
| Nitrogen, $N^2$ | 81.2 | 81.1 | 1.6 | 8 .5 |
| | 100.0 | 100.0 | 100.0 | 100.0 |

TABLE NO. 2 (b)

DATA FOR HEAT BALANCE.

| | | | |
|---|---|---|---|
| Carbon in combustible— | | | 87. per cent |
| Hydrogen in combustible— | | | 4.7 " |
| Carbonic Oxide in combustible— | 13.1 plus .9 | x 87. = | 5.6 " |
| Hot gas, not including moisture, per pound of carbon— | | | 17.95 pounds |
| Hot gas, not including moisture, per pound of combustible— | | | 15.62 " |
| Temperature of gases above air - | 513 — 72 = | | 441. deg. |
| Heat in one pound of moisture in the gases— | | | 1251. B. T. U. |

TABLE NO. 2 (c).

HEAT BALANCE.

Total heat of combustion calculated from analysis, per lb of combustible, (Carbon 82.6 per cent, Hydrogen 4.5 per cent, Ash 5.1 per cent. Oxygen 4.8 per cent, Nitrogen and Sulphur 3 per cent..... 15,169

| | B. T. U. | Per cent. |
|---|---|---|
| 1. Heat absorbed in useful evaporation— 11.74 x 966 = ..... | 11,347 | 74.8 |
| 2. Heat lost in hot gas—15.62 x 441 x .238 = ..... | 1,639 | 10.8 |
| 3. Heat lost by sensible and latent heat of moisture in coal, and moisture formed by burning hydrogen—(.047 x 9 plus .024) x 1251 = ..... | 562 | 3.6 |
| 4. Heat of combustion lost by unconsumed CO, .056 x 10.050 = ..... | 503 | 3.2 |
| 5. Radiation as per test— ..... | 365 | 2.4 |
| 6. Loss from carbon in smoke, hydro-carbons in same, and unaccounted for— .... | 753 | 5.2 |
| | 15,169 | |

It appears from these results that, in point of economy, the boiler compares favorably with the best types. An evaporation of 11,922 pounds of water per pound of combustible, which was obtained on the test of November 2d, is rarely exceeded by any form of hand-fired water tube boiler, whatever its size. One of the noticeable features in the operation of the boiler was the dryness of the steam exhibited on all the tests. Even with conditions of forced blast, when over seven pounds of water was evaporated per square foot of surface per hour, the moisture was less than 1 per cent.

The heat balance, given in Table No 2, shows that practically all of the heat units available in the coal were accounted for, either in useful evaporation or in chimney and other wastes.

## SEASON COAL SHIPMENTS FROM ERIE.

The official reports of the shipments of coal from Erie gives 492,536 tons of anthracite and 179,640 tons of bituminous. This is 12,000 tons more anthracite than was shipped in 1895.

## MILWAUKEE LODGE.

At the last regular meeting of Milwaukee Lodge, Lake Shipmasters' Association the following officers were elected for the ensuing year: President, Henry Leisk; first vice president, John McCoy; second vice president, Peter Anderson; secretary, John McSweeney; treasurer, Fred. Starke; delegates to grand lodge, Henry Leisk and Edward Saveland.

## COAL SUPPLY AT DULUTH.

The receipts of coal at the head of Lake Superior for 1896 were 2,058,809 tons—594,859 tons anthracite and 1,463,950 tons bituminous. In 1895 the total receipts were 1,837,052 tons—543,645 hard and 1,293,407 tons soft; in 1894, 2,275,139 tons—632,234 hard and 1,142,905 soft; in 1893, 2,279,372 tons—640,910 hard and 1,638,432 soft; in 1892, 1,683,381 tons—490,367 hard and 1,193,214 soft. Competent coal men estimate that they have sufficient coal to last them into the spring until navigation opens, but it is thought that the figures are very close, and that there will be very little if any coal carried over. The shipments of coal from the head of the lake docks since May 1 have amounted to 942,715 tons, which leaves on the docks at the close of navigation a stock of 1,166,094 tons. There was less coal on hand at the opening of navigaiton at Superior and Duluth this year than there had been before for several years, being only 222,727 tons. Last year on May 1 there was a stock of 523,292.

## A DEFECTIVE BOILER.

A special from Cheboygan says the coroner's jury on the boiler explosion on the barge Rhoda Stewart, which killed three men last May, stated in their verdict that the boiler had been weakened by the United States inspectors in their examination shortly before the accident.

The officers of the barge were also censured for leaving port with the boiler in such a condition.

## THE BUFFALO ELECTION.

The annual election of the Buffalo Lodge of the Shipmasters' Association resulted in the choice of A. Clark, president; L. P. Goodale, first vice president; Frank Welcome, second vice president; Lyman Hunt, treasurer; John Perew, secretary. Messrs. Clark and McCabe, incoming and outgoing presidents, will attend the meeting of the National lodge in Washington on January 12th.

## QUARTER'S SHIPBUILDING.

Sailing and steam vessels built in the United States, and officially numbered as shown by the records of the Bureau of Navigation, Treasury Department, during the quarter ended December 31, 1896.

| | WOOD. | | | | STEEL. | |
|---|---|---|---|---|---|---|
| | SAIL. | | STEAM | | STEAM. | |
| | No. | Gross | No | Gross | No. | Gross. |
| Atlantic and Gulf.... | 94 | 2,366.34 | 23 | 3.319.51 | 4 | 9 442.76 |
| Pacific..... | 10 | 1,965.17 | 5 | 1,282.45 | ..... | ..... |
| Great Lakes..... | 3 | 43.00 | 1 | 10.40 | 3 | 13,890.30 |
| Western Rivers..... | ..... | ..... | 24 | 3.784.80 | 1 | 390.51 |
| Total..... | 107 | 4 374.51 | 53 | 8 397.16 | 8 | 23.7.3.57 |

SUMMARY.

| | No. | Gross Tons. |
|---|---|---|
| Total Sail ..... | 107 | 4,374.51 |
| Total Steam..... | 61 | 32.120.73 |
| Grand Total..... | 168 | 36,495.24 |

PREVIOUS QUARTER, SEPTEMBER 30, 1896.

| | No. | Gross Tons. |
|---|---|---|
| Total Sail ..... | 115 | 30.209.30 |
| Total Steam..... | 101 | 46 867.87 |
| Grand Total..... | 216 | 77,077.17 |

## ELEVATOR CHARGES.

During the past week there has ben considerable talk among vesselmen about charges for discharging grain at Buffalo and the killing of a bill at Albany which provided for the state operating elevators at that port. According to the talk, a nominal sum was to be charged at the elevators to be operated under that plan. The bill, it is said, was killed by the elevator pool, and a Buffalo vesselman is mentioned in connection with the deal. A meeting of the executive committee of the Lake Carriers' Association has been called, when the matter will be taken up. President Brown, of Buffalo, will explain the matter to the satisfaction of all interests.

Certainly Captain Brown has only one interest, and that is the most beneficial one for the lake vessel-owners, of whom he is one of the most prominent.

## NOTES.

The steamer City of Glasgow came out of the stationary dry-dock at Milwaukee this week, and the steamer Lora took her place to be lengthened.

There is a curious admiralty case coming up in the United States court at Utica, N. Y., soon which involves the power of agents of boats to hold them for their turn on an agreement to wait for loads till other boats which arrived ahead of them are loaded. It appears that some of the boats in last season's agreement violated the rule laid down and there has been a friendly case made up to test the legality of such agreements. It is at least very singular that owners may not charter their steamers or sail vessels for what they please and on whatever terms they like in spite of admiralty decisions to the contrary.

We often grumble at the ignorance of foreigners and especially the English in making breaks about our geography. Now comes in the current issue of Cassier's Magazine and one of its illustrations is labeled "The Steamer 'North Land,' sister ship to the 'North West,' in the West Superior dry-dock at Duluth, Minn." Cassier's is published at New York, and such ignorance of the Northwest is almost deplorable. The writer of the article, or at least the editor, might know the difference between a Minnesota and Wisconsin port or dry-dock. W. Superior is in Wisconsin, Duluth in Minnesota.

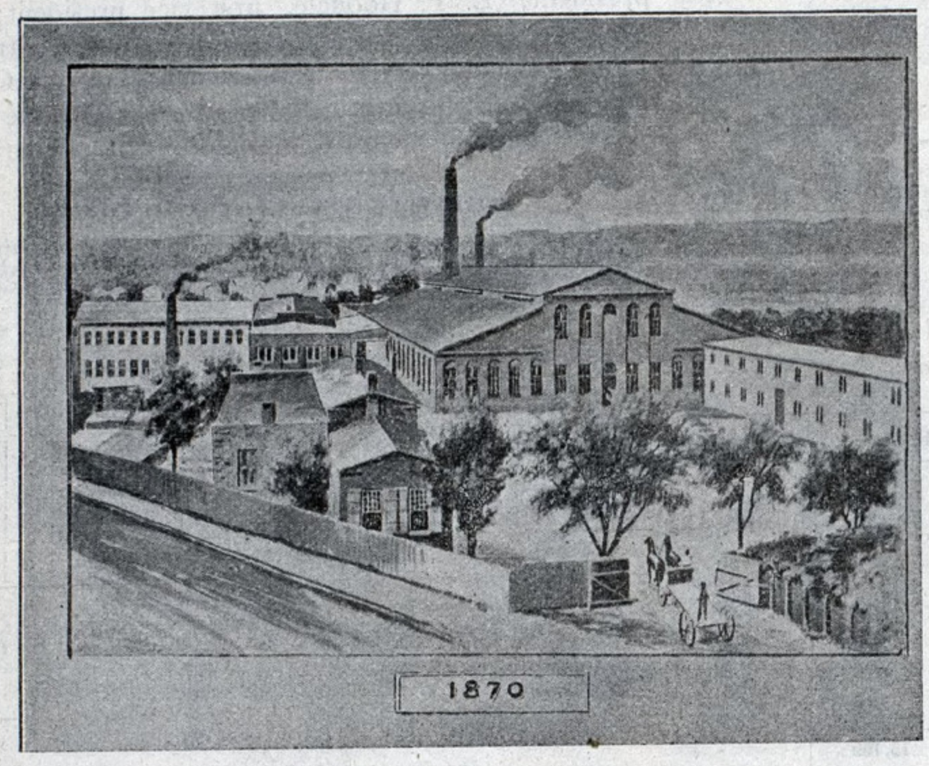
H. D. Edwards & Co., 16-24 Woodward avenue, Detroit, Mich., have been appointed general agents for the Northwest of The Peerless Rubber Manufacturing Co., 16 Warren street, New York. They will carry in their warehouses a complete line of the highest grade of rubber belting hose, packing and general rubber goods for mechanical purposes. H. D. Edwards & Co. was established in 1855, and are one of the best known supply houses in the West, always representing the largest and best firms in the country.

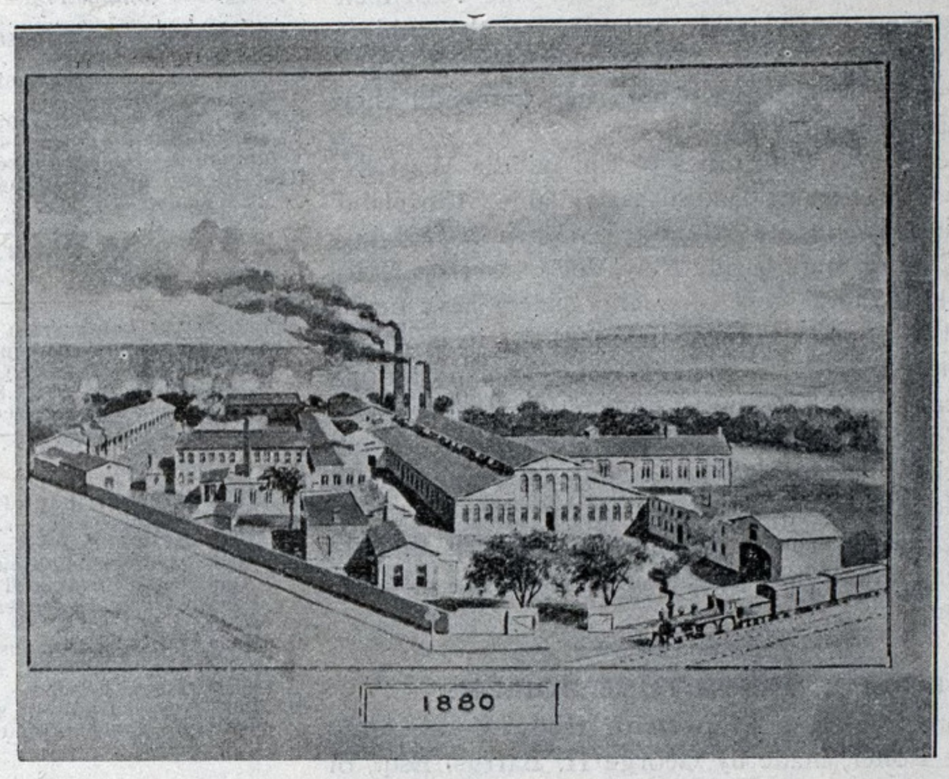
## HERALDING A FIRM'S PROSPERITY.

Illustrated.

One of the most prominent and successful business firms in the United States is that of Randolph & Clowes, Waterbury, Conn.

Mr. Clowes is the executive head of the firm of Randolph & Clowes, manufacturers of every conceivable device in brass, copper or bronze. It is he who has brought the concern up from the wreck of a once fairly prosperous business to proportions of prosperity which would have been considered an utter imposibility at the time he took hold.



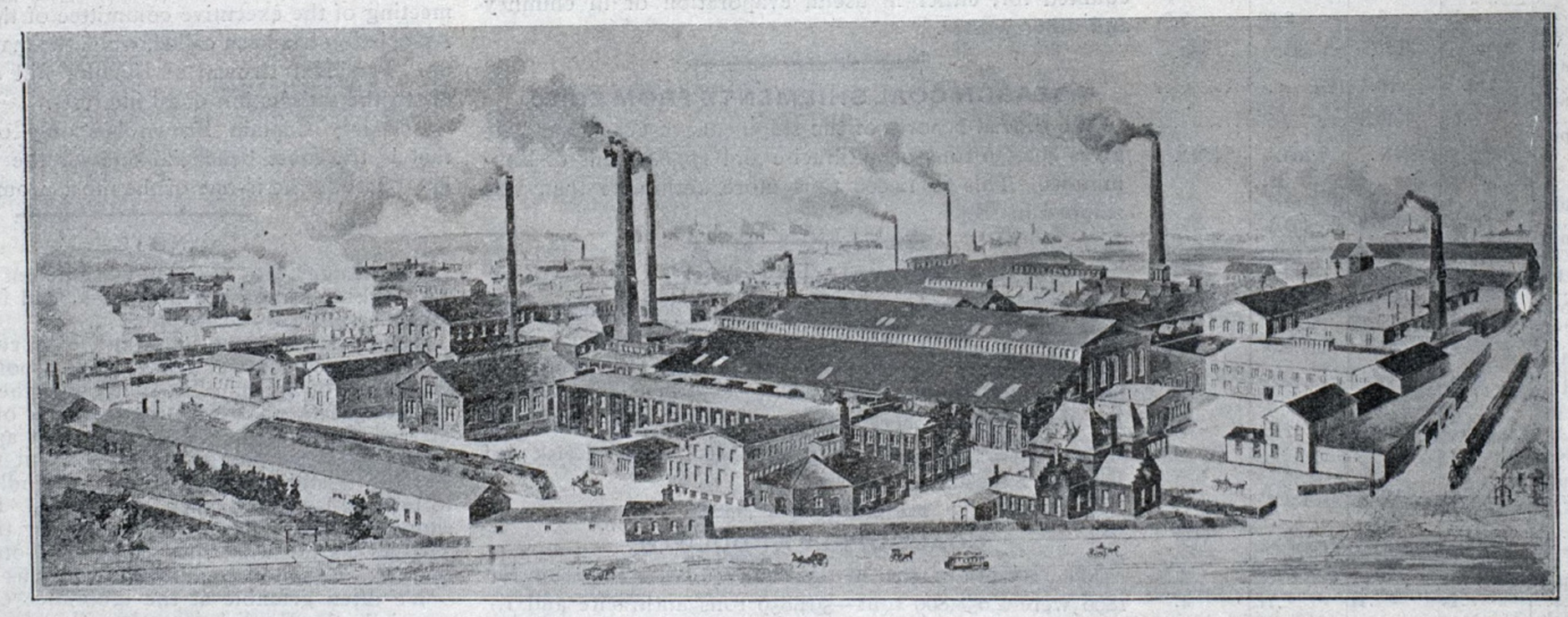




On taking over the management in April, 1896, the concern employed fifty men and one clerk. Their office quarters consisted of a room about fourteen feet square. Now there are more than five hundred hands employed, with eight superintendents. The firm has also established important branches in New York, Boston, Chicago, Cincinnati and Philadelphia.

During the first three years of Mr. Clowes' management only $105,000 capital was paid in, yet at the end of that time the firm, in its seamless tube, brazed tube and kettle departments, was transacting a business exceeding $600,000 per year, a most remarkable showing upon the original investments.

After this achievement had been accomplished, Mr. Clowes, with his energy , ability and skill, saw an opportunity to make another advantageous move, and he lost no time in carrying it out. Consuming as they did large quantities of sheet brass and sheet copper, his business sagacity suggested the propriety of his firm engaging in its manufacture. Its increased business had also outgrown the quarters which it then occupied. In 1889 Messrs. Randolph & Clowes purchased from the trustees of Brown & Brothers, at a cost of $75,000, the rolling mill of the old firm, the largest single rolling mill in the country, together with the remainder of the property. It was a business venture at which many old and experienced manufactures shook their heads, predicting only impending ruin and disaster to the young and thriving firm.

Starting with about two hundred customers, the firm now has nearly five thousand in all parts of the world. Over $600,000 has been spent in improving the property as originally purchased. The cost, therefore, of this plant, now over seven acres in extent, and after starting in such modest proportions, is to the partners over $700,000. The betterment to the property, taking into consideration the constantly increasing success of the enterprise, gives it a value more than double the entire cost.



MILLS, FACTORIES AND OFFICES OF RANDOLPH AND CLOWES, WATERBURY, CONN., 1896.

## OCEAN, LAKE AND RIVER STEAMERS.

A discussion of "American Lake and Ocean Steamship Models," by Joseph R. Oldham, N. A., M. E., in the January Cassier's Magazine, gives, with numerous illustrations and mathematical demonstrations, some interesting facts concerning the leading types of construction of hulls and machinery on the ocean and inland waters. Mr. Oldham holds that high speed river steamers or lake steamers may be made comparatively full amidships, with fine ends, whilst steamers engaged in a generally rough water voyage should have their buoyancy more largely distributed toward the bow and stern to prevent excessive pitching in a seaway. With regard to American lake steamers, it appears to Mr. Oldham that the problem facing the designer of a passenger steamer for service is by no means easy of solution. Discussing the comparative merits of single and twin screws, he admits there are certain great advantages connected with the adoption of twin screws, but thinks these advantages may be too dearly bought. Increased length means increased risk when navigating shallow and tortuous rivers and harbors, and for such work twin screws are certainly more suitable than a single screw would be; but the general economic efficiency available by resorting to augmented length and single screw propulsion is manifest. In conclusion he maintains, as clearly demonstrated, that the higher the speed, the greater the safety; and the more palatial and luxurious the apartments and furnishings, the more satisfactory will be the commercial results of operating lake, river or ocean steamships.

## A CANADIAN HERO.

Assistance has been asked from the Swedish and Norwegian consulate at Quebec to trace the relatives and chronicle the act of a young Canadian seaman (supposed of French extraction). Charles Gebhart by name, who formed part of the crew of the bark Caledonia, of Drammen, Norway, and who, at the foundering of the that vessel in the Bay of Biscay, on the 7th of October last, when in the last moment, going to fetch a life buoy for the preservation of his own life a little longer from a watery grave, finding the carpenter of the vessel going with the same purpose in view, exclaimed: "Do you also want it, carpenter? Well, take it; you have a family. Don't mind me." He could not swim and was drowned, while the carpenter, a married man residing in Drammen, Norway, was picked up by the boat of an English vessel near at hand, and was saved. Relatives or connections of this Canadian hero reading this notice will please communicate their name and address to the Swedish and Norwegian consulate at Quebec, or to the owner of the vessel, Mr. James S. Lorentzen, Drammen, Norway.

Gebhardt was shipped in Liverpool, England, in the latter part of the month of September last.

## SOUTHERN PIG IRON IN DEMAND.

Ironmasters say that the demand by foreign buyers for Alabama pig iron is unprecedented. The Tennessee Iron, Coal & Railroad Co. recently shipped 2,500 tons to Liverpool, and has inquiries for prices on an aggregate of 30,000 tons from Rotterdam, Genoa and other European points. The Sloss Iron & Steel Co. have booked an order for 3,000 tons from Calcutta, India, and the same buyer wants quotations on 3,000 tons more.

## NEW STEEL STEAMER JOHN ENGLIS.

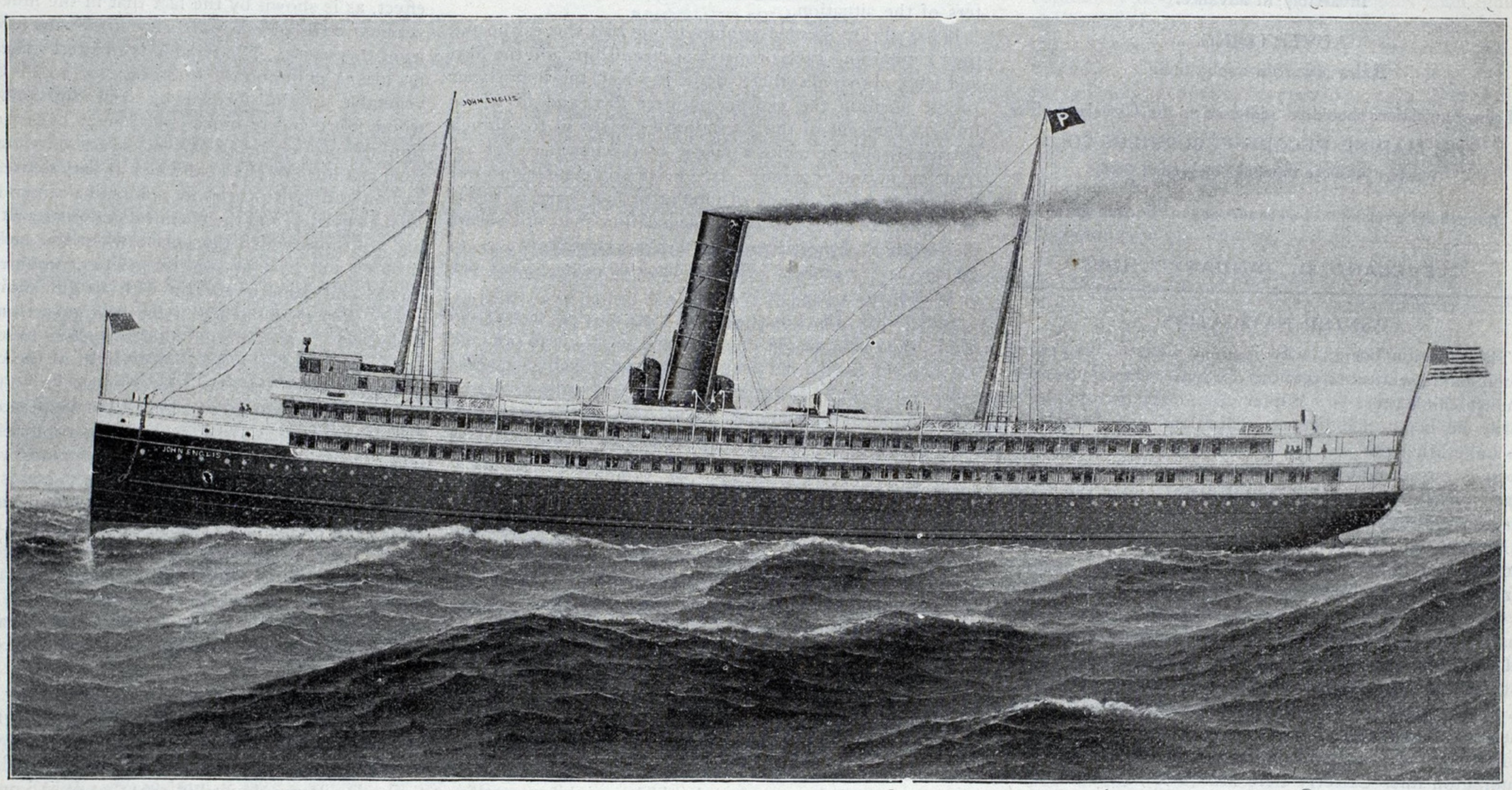
Illustrated.

The new steamer herewith illustrated was built at Chester, Pa., and will make her first trip this week. Her general dimensions are 313 feet 4 inches over all, 290 feet between perpendiculars; 46 feet beam and 17 feet 6 inches depth of hold. Her displacement is about 3,100 tons and her net tonnage 1987.

The engine of the triple expansion type, with cylinders 30, 48 and 75 inches in diameter, and a stroke of 56 inches to make about 96 revolutions a minute. The propeller wheel, which was cast from open hearth steel in one piece by the Penn Steel Casting and Machine Company, of Chester, Pa., is the largest steel propeller wheel ever cast in this country, and is 16 feet in diameter. Steam is supplied by six Scotch boilers, 13 feet in length and 13 feet 2 inches in diameter, each equipped with three Purvis ribbed-steel furnaces, 40 inches in diameter. The working pressure is 180 pounds to the square inch. The indicated horse-power of the engine exceeds 4,000.

The Englis has 126 first-class staterooms, fitted withall modern conveniences. She cost upwards of $350,000, and was named in honor of the pioneer wooden shipbuilder at Greenpoint, L. I., whose son is now an active member in the Marine Steamship Co., owners of the boat. Her builders guarantee that she shall maintain a speed of 17 knots an hour from wharf to wharf, and considering the slow runs up the East river, through portions of the Sound, and in approaching her docks, and in the harbor at Portland, she will have to make and maintain a speed of about 18 knots an hour. Ample provision has been made for this unusual requirement, however, and there is plenty of boiler and engine power given to do this.

The Cleveland City Forge furnished her shaft, pumps from the Blake Manufacturing Co. The General Electric Co. put in the electric light plant, Chas. Cory & Son the bell hanging and connections, Katzenstein packing and H. C. Calkins life rafts. The thanks of the Record are due the Marine Journal, New York, for the cut and also excrept of description, etc., of this coastwise steamer.




**STEEL STEAMER JOHN ENGLIS.**

Built at Roach's Delaware River Iron Shipbuilding and Engine Works, Chester, Pa., for the Maine Steamship Co.—Portland route.

## DOWN EAST FREIGHT REPORT.

The usual weekly freight report from New York, Philadelphia, Baltimore and other neighboring ports, as furnished the Marine Record by French, Edye & Co., New York, shows that the past week's business, equally with that of the preceding sen'night, has been fairly active, and considerably better in this respect than we have been accustomed to see it during many preceding years. We cannot report any particular change from rates last prevailing in any direction, nor the inquiry particularly brisk; but boats now offering find prompt takers at former figures. Steamers close at hand are no longer scarce, and grain tonnage for January commands little, if any, increase over rates current on grain for later months, viz.: 3s. 1½d. @ 3s. 3d. for Cork f. o. b., 2s. 9d. @ 2s. 10½d. direct, as to size and port of discharge, from range of loading ports.

The close of the year showed a quiet but firm market as regards sailing vessels on the spot or close at hand, whilst fair offers for later months are not easily obtainable. As the bulk of vessels now on passage to this side are, however, provided for, it looks as if, after the turn of the year, business should revive and a more active market insure advanced rates.

## WINTER STORAGE CHARTERS.

The grain capacity of the fleet wintering at Chicago is estimated at 6,000,000 bushels, or about 43 per cent. less than that of the vessels which wintered there a year ago. The going rate is 2 3-4 cents on wheat instead of 3 cents as has been given out. However, on Saturday last vessels were chartered for 350,000 bushels of corn, at 2½ and 2⅝ cents, according to size of craft. The steamer James H. Prentice is among the vessels at Chicago which has taken on a cargo of wheat. Storage and freight rate 2⅞ cents. The present mild weather keeps corn from curing and vesselmen are not at all anxious to take the cereal out of the elevators. It is mentioned as a significant fact that with a single exception the vessels thus far chartered are in the A-2 class, a grade which the underwriters as a rule do not care to take risks upon. The case of one vessel is cited for which even harbor risks were secured with some difficulty. The steamer P. D. Armour has been chartered for 115,000 bushels of barley for winter storage and spring delivery, the freight rate being 2 cents.

The steamer Walter Vail of the Malwaukee winter fleet is to load 85,000 bushels of oats as soon as she gets her coal cargo discharged, which will be some time this week. The freight and storage rate is the same as was fixed for the barge Baltic, now nearly loaded. The steamer F. L. Vance has commenced loading barley. She will take 95,000 bushels.

## WINTER FLEET AT MILWAUKEE.

Steamers: Maryland, Manchester, Massachusetts, Manhattan, Merrimac, Minnesota, City of Glasgow, Majestic, Ferd Schlesinger, Helena, Veronica, Neosho, Italia, Mary A. McGregor, E. A. Shores, Lora, Joys, Hilton, Ed. Buckley, Bloomer Girl, Mary Mills, W. M. Egan, R. P. Fitzgerald, W. H. Wolf, Fred Pabst, George H. Dyer, Frank L. Vance, Marion, W. B. Morley, Walter Vail, John W. Glidden, Sscanaba, Conemaugh, Inter-Ocean, George C. Markham, Westover, Colin Campbell, George Burnham, John Schroeder, C. Hickox and revenue steamer, Andrew Johnson.

Schooners: Walhalla, Minnehaha, Black Hawk, Alice M. Beers, Charles Marshall, Annie Dall M. Capron, Nellie and Annie, Elida, Dan Mabee, Narragansett, B. F. Wade, Pride, Maggie Thompson, L. W. Perry, Conquest, Aniie O. Hanson, A. B. C. F. M., Boaz, C. Harrison, Allen Day, Emma Banner, M. A. Gregory, Oneida, C. E. Wyman, Ebenezer, Ida, S. Thal, E. Scoville, Challenge, Willie Loutit, Elva, La Petite, Emily and Eliza, Charles Luling, Kewaunee, John C. Bauer, M. N. Dunham, Fearless and Star Co.

Barges: Amboy, Wadena, Aberdeen, Baltic, Sidney O. Neff, J. S. Ryan, Grace Grummond, Metacomet, Noquebay, Richard Winslow, A. T. Bliss, Bahama and Noah's Ark.

Besides the fleet of steam and sail in winter moorings, there are five lines of steamers in active commission out of Milwaukee during the winter season—the Goodrich Transportation Co., with four steamers, West shore points; the F. & P. M. R. R. to Ludington and Manistee and all points East, via F. & P. M. R. R., four steamers in active service daily; the Crosby Transportation Co. to Grand Haven and Muskegon, and all Eastern points, via D., G. H. & M. R. R., four steamers in active daily service; the Hurson Transportation Co., with two steamers on the West shore to Chicago and intermediate points. The Chicago & West Michigan R. R. has a line of two steamers also via Muskegon from Milwaukee in the winter service.

On January 1st the firm of Hine & Robertson Co. will be succeeded by James L. Robertson & Sons. The same persons interested in the Hine & Robertson Co. and the management of the new firm will be identical. The death of Mr. F. A. Hine in 1893 and admission of Mr. Robertson's sons into partnership suggest this change.

MARINE RECORD

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CLEVELAND, O., JANUARY 7, 1897.

## WINTER NAVIGATION.

The question occurs, why is Lake Erie so far behind Michigan in winter navigation? Perhaps there is no trade; but we think there is. Winter communication might as easily be kept open between Cleveland and Buffalo as on Lake Michigan, and the only reason why it is not kept open is on account of the underwriters, and the particular conservancy of Cleveland owners, who are more than susceptible of risks.

Now let us look at Lake Michigan, and we find that during this winter the Flint & Pere Marquette people maintain a strong lead over the field, having constructed a steel carrying steamer for the Manitowoc route and chartered a steamer of much greater carrying capacity to fill the place of the F. & P M. No. 1, now owned by the Hurson Transportation Company. The various east shore routes and the steamers either already covering or to cover them are as follows:

Flint & Pere Marquette Milwaukee, Manitowoc and Ludington line—Carferry Pere Marquette, steamers Nos. 2, 3, 4, 5 and Mary H. Boyce.

Milwaukee, Muskegon and Grand Rapids line—Steamers Lawrence and Petoskey.

Crosby, Milwaukee and Muskegon line—Steamers Osceola and City of Grand Traverse.

Grand Trunk Milwaukee and Grand Haven line—Steamers Nyack and Wisconsin.

Graham & Morton Milwaukee, St. Joseph and Benton Harbor line—Steamers Jay Gould and City of Duluth.

Ann Arbor line between Kewaunee, Manitowoc and Frankfort—Carferries Nos. 1 and 2, steamers George Farwell and J. C. Ford.

This constitutes a fleet of eighteen steamers to cover the different routes between the east and west shores of Lake Michigan as against ten a year ago, and should business offer and the weather continu reasonably favorble, it may prove a difficult matter to furnish cars to east shore terminals to keep the freight moving. For handling grain there is the Flint & Pere Marquette elevator at Ludington, while the Pain Bros.'s Company has leased the Big Four elevator at Benton Harbor, and F. Kraus & Co. are erecting one at Grand Haven which will be in running order by February 15. The combined handling capacity of these three elevators is placed at nearly 150,000 per day, an amount considerably in excess of possible shipments from Milwaukee, and sales can therefore be made without the slightest fear of delay in delivery unless through snow blockades or otherwise the east shore lines should be deprived of cars for trans-shipment.

This being the case on Lake Michigan, there is no reason why winter communication should not be kept open on Lake Erie at any ports desirable.

Relative to the insurance of vessels in winter traffic, it is possible that our people have not yet been educated to the fact that the underwriting world is wide open for risks, and is willing to accept any probable venture which may come before them on a paying premium. Lake Michigan and the Straits of Mackinac being kept open all winter with an almost futile attempt on Lake Erie, we would ask why should not navigation proceed in cargo and passenger steamers on Lake Erie the year round.

## THE ENGINEER SIDE OF IT.

In a letter to the Engineer, of New York City, a correspondent seems to hit the nail on the head in the following trenchant and pertinent letter:

The beginning of the new year marks a page in the history of the marine engineer, in that it establishes his status beyond question, and which it took an act of Congress to specify. But for the M. E. B. A. this condition of affairs would not have been brought about, and Mr. Griscom, aided and abetted by the ex-Secretary of the Treasury, Charles Foster, and his successor, would have been masters of the situation.

It has always seemed strange to me that those who put their capital into such property as steamships and the like, and who, above all others, know too well the importance of the position the marine engineer fills, and to whom fully 75 per cent of the operating expenses of the ship is entrusted, should make a target of the engineer for retrenchment and economy. It is a sad commentary on our institutions when a body of intelligent men have to resort to organized efforts to obtain legislation that will secure their rights. More than once I have known owners to say to their engineers: "I will have to reduce your pay or be obliged to lay the boat up."

Sad, isn't it, that the keeper of a steamer in service depends upon whether the engineer will work for 10 per cent less or not? In the old beam engine times owners seemed well contented to pay good salaries; but with increased horse power and piston speed, and with all the auxiliaries that are now essential to a well equipped plant, such as electric, refrigerating, hydraulic and steam heating appliances, there is no perceptible difference in the engineer's pay. Look at our modern war vessels and passenger ships. These wonderful creations require something more than an ordinary mind to control. The man who takes charge of the motive power of one of these vessels must not only have an excellent education, but remarkable brain power and severe training. Without him not a helm could be swung, not a searchlight flashed, not an anchor weighed, not a cargo discharged, no perishable freight preserved, and not a record broken. Yet this individual was declared to be not an offier! Forsooth, what is he? He will know on New Year's Day, 1897, for then he will receive a gift from the last Congress in the form of a law that will place him where he belongs; 1897 should be a jubilee year for our organization, for then we begin to reap the reward of our victory.

In this part of the world matters pertaining to our craft are dull. Four years ago there was nothing to complain of. Engineers found plenty to do and received good salaries. But with the advent of railroads, a falling off in land booming and the influx of people incident to it, steamboating has declined. There is no increase in the steam mosquito fleet, for when one wants a small craft he will build a gasoline boat. This has been carried to such an extent that everywhere one goes one or a dozen of these stinking little mongrels will be encountered. They roam at will with no governmental restrictions or requirements. Seagoing craft thus engined are becoming numerous on the Pacific coast.

Well, we do not wonder at the Engineer's correspondent getting off at such a tangent, and he happens to be about right all through, as the Record has frequently pointed out—an engineer not an officer, ay? The rap at Charles Foster and Mr. Griscom is well timed. We would also say that the Hon. James A. Dumont had some shortcomings in the matter, only that we happen to know, or believe that his logic was overcome, and he had to abide by the unlooked for consequences.

However, in righting themselves the marine engineers have done a good turn for the deck officers.

Instead of going up for a dog tax each year, they now have fire to run, and the control of the ship, from the stoke-hold to the deck, is happily placed in the hands of American officers. Our Pacific Slope friend may have something to grumble about; but again, let us see anything wrong with the gasoline boat, and it can and will be as easily rectified as the past abuse of not recognizing marine engineers as ship officers.

## SPONTANEOUS COMBUSTION OF COAL.

While large quantities of coal are carried on the lakes each season we do not hear of any experiences of spontaneous combustion, because the cargo is not held long enough to generate the gas which causes, or leads up to the ignition.

In this connection the following paper from the Transactions of the Society of Arts, by Vivian B. Lewes, F. I. C., F. C. S., is very interesting, and is in part as follows:

The heating of masses of coal exceeding 2,000 tons has led to such inconvenience and loss in shipment and storage as to render the question of spontaneous ignition a serious one, and in 1875 the losses of life and property were so great as to demand attention from a royal commission. The report of this commission had little beneficial effect, as is shown by the fact that in the nine succeeding years 57 coal-laden vessels were known to have been lost from this cause. The trouble is greatest at sea, but is by no means unimportant in storage of coal. Coal is of a vegetable origin, formed by heat and pressure upon woody fibre and resinous constituents of an early vegetation, the process being carried on out of contact with air. Coal is a form of charcoal which is very dense, and beside carbon and hydro-carbons, it contains mineral substances such as pyrites, and the chemical actions resulting in heating are those which take place when the carbon, hydrocarbons and coal brasses or pyrites contained in newly mined coal come in contact with air and moisture.

The greatest influence in the heating action is carbon, which acts to attract and condense gases to a degree depending upon the fineness of division of the carbon, new coal sometimes absorbing three times its volume of gas. The action is influenced greatly by temperature. When carbon of coal absorbs oxygen the compressed air becomes very active chemically and combines with the carbon and hydrogen of the bituminous portions converting them into carbon dioxide and water vapor with a rapidly increasing temperature, which finally reaches the igniting point. The temperature of the coal before the action commences has an important influence, an analagous case being that of oily waste or cotton which if warmed to 130 degrees F. will ignite in one and a quarter hours, whereas at ordinary temperatures it does not ignite within several days.

The earliest theory of spontaneous ignition of coal was that the heat was due to the oxidation of pyrites, which was shown to be erroneous twenty years ago, but in spite of this the idea is quite generally accepted at the present time. Dr. Percy showed in 1864 that oxidation of the coal had much to do with the action. There is considerable action, however, between oxygen and finely divided portions of pyrites with efflorescence, and from this action the opinion has prevailed that the heating is due to the oxidaition of the pyrites. The only way in which pyrites in the cleavage of coal can assist spontaneous ignition is that when they oxidize they swell and cause disintegration of the lumps of coal so exposing fresh surfaces to absorb oxygen and afterward carry on chemical action. I have carefully determined the igniting point of various kinds of coal and find that—

Cannel coal ignites at 690 degrees F.
Hartlepool coal ignites at 766 degrees F.
Lignite coal ignites at 842 degrees F.
Welsh steam coal ignites at 870 degrees F.

Heating does not take place, as a rule, with newly mined coal unless piled in unusually large heaps. It at once commences to absorb oxygen from the air, but in small heaps the circulation around the lumps keeps down the temperature. After repeated handling when the coal becomes powdered as in its loading upon ships, the large surfaces exposed freshly to the air cause rapid absorption of oxygen and consequent rise of temperature.

On examining the evidence to be obtained as to the conditions under which spontaneous ignition of coal usually takes place, it is found that the liability increases with:

1. The increase in mass of coal. The larger the mass the more the conducting material between the coal which

is heating and the outer air, also the larger the mass the greater will be the disintegration.

2. The ports to which shipments are made; 26,631 shipments to European ports in 1873 resulted in ten casualities against sixty from 4,485 shipments to Asia, Africa and America. The increase of temperature in the tropics converts a slow action into a rapid one.

3. The kind of coal. Pyrites has no heating effect, and a sure guide is to be found in the quantity of moisture present in an air dried sample of coal. The higher the amount of moisture held by the coal after exposure for some time in dry air, the greater will be its power of absorption of oxygen and its liabilty to spontaneous heating.

4. The size of the coal. Small coal being more liable to this trouble than large on account of the greater surface exposed.

5. Shipping or storing coal while wet. At first external wetting retards the absorption of oxygen, but the presence of moisture afterward increases the action of the already absorbed oxygen upon the hydro-carbons of the coal, and so causes a serious increase in the heating.

6. Ventilation of the mass of coal. Ventilation increases the difficulty unless cool air is furnished continuously and freely throuhout the coal.

7. Rise in temperature. Anything which tends to increase hastens the chemical action.

Causes can sometimes be traced to steam pipes, boiler flues and warm walls.

Our thanks are due to Charles D. Sigsbee, Commander U.S.N., hydrographer Bureau of Navigation Department of the Navy, Washington, D. C., for a copy of the pilot chart of the North Atlantic for December. The present issue seems more interesting than usual because it contains data not generally issued on the monthly charts. The Hydrographic Office is to be credited with making steamboat lanes across the Atlantic so that it minimizes the chances of collision, and makes safer the Atlantic ferry.

## LAKE LEVELS.

The New York papers are taking quite an interest in lake levels; moreover, they may be somewhat jealous of Chicago's influence on trade. However this may be we find that they are now harping upon what The Record pointed out several years ago, and much in the same strain, as the New York Times says: "The canal which is to prevent the polution of Chicago's water supply by reversing the current of the Chicago River and carying the city's sewage southwestward 28 miles to a tributary of the Mississippi, is now almost completed, at a cost of nearly $30,000,000. The residents of the valley through which the diluted sewage will pass after it shall have been discharged from the canal, consented to this use of the Illinois river, upon condition Chicago would eventually enlarge the canal to the capacity of a channel for ships, and would co-operate with them in procuring Federal appropriations for the compleiton of such a channel by the improvement of the river.

Suspecting now that Chicago will be content with a sewage canal, and has lost interst in the ship-canal project, these people have discovered that the flow of sewage will injure them. It will effect the health of people in the valley, they say, will make the annual floods larger, and will invite pestilence by making the deposited sediment dangerous. They demand that measures shall be taken to provide for that enlargement and improvemnt which was contemplated, in order that they may, at least, enjoy the promised advantages as compensation for the injuries which they must endure. The Chicago newspapers say that the city must stand by the agreement. There will be, we presume, a concerted movement to procure large Federal appropriations for the construction of a ship canal on the line of the Illinois river. The estimate of cost is $24,000,000.

The sewage canal has been made with a present capacity of 300,000 cubic feet of water per minute, but the cuts through nine miles of rock are wide enough for a flow of 600,000 feet, and in due time the entire channel is to be enlarged to correspond with these cuts. By such an enlargement and the desired canalization of the river below, a ship canal to the Mississippi would be compieted.

It is estimated that the continuous withdrawal of 300,000 cubic feet of water minute from Lake Michigan would lower the surface level of the lakes from three to five inches. For two or three years past the level has been exceptionally low, and the lake cities, both in Canada and this country, have protested against the additional reduction which will be caused, it is expected, by the use of the sewage canal. It is already difficult to preserve a sufficient depth of water in the lake harbors. An enlargement of the canal to a capacity of 600,000 cubic feet would double the drain from the lakes.

It is noticeable that the Chicago press now urges that the depth of water in the lakes and the lake harbors should be regulated and maintained by a series of great dams. "What is needed," says the Chicago Tribune, "is to impound the water of the lakes by a dam in the Niagara river below Buffalo, which will throw back the water of Lake Erie four or five feet, and by wing dams above Detroit, which would have a similar effect upon Lakes Huron and Michigan." Something of this kind may be required if to natural causes which reduce the depth of water is to be added an outflow of 600,000 cubic feet per minute for the removal of Chicago's sewage and the promotion of commerce on a ship canal through the State of Illinois. The public should understand what the situation is, for we shall hear more about these projects by and by, and Canada, as well as this country, has a considerable interest in them.

## ANOTHER NEW LINE.

By next April the Baltimore & Ohio railroad will have a new line to Lake Michigan. Work will soon begin on a line from Nappanee, Ind., to South Bend, where it will join the St. Joseph Valley railroad, now under construction. This is a line the Baltimore & Ohio has for many years wanted, for it will enable it to handle the great Northwestern grain shipments that can be reached by steamers from Milwaukee to Benton Harbor.

## MARINE ENGINEERS' ASSOCIATION.

At the regular meeting of the Marine Engineers' Beneficial Association No. 9, held Saturday evening at Milwaukee the following officers were elected for the ensuing year: President, J. C. Collins; first vice president, W. G. Fell; second vice-president, G. C. Olesen; treasurer, J. Havlick; financial secretary, John J. Conway; corresponding secretary, Charles G. Forsyth; recording secretary, J. D. Desmond; chaplain, J. J. Staley; conductor, James Daley; outer doorkeeper, Charles McCarthy; inner doorkeeper, Edgar Doucett; trustees, Webb Chipman, Jr., G. C. Olesen and J. E. Packard; delegate to national convention, J. C. Collins.

## AVERAGE GRAIN FREIGHTS SINCE 1890.

The appended statement shows the average of lake freights on wheat and corn between Chicago and Buffalo during each month in the past seven seasons; also the highest rate on wheat in each season:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1890— | | | | | | | |
| Wheat | 1.7 | 2.2 | 2.3 | 1.5 | 1.9 | 1.9 | 1.9 |
| Corn | 1.4 | 1.9 | 2.0 | 1.2 | 1.6 | 1.7 | 1.6 |

Highest rate on wheat during 1890—2½c.
Average on wheat for season 1890—1.9c.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1891— | | | | | | | |
| Wheat | 1.4 | 1.1 | 2.1 | 2.7 | 3.3 | 2.2 | 4.1 |
| Corn | 1.2 | 1.1 | 1.8 | 2.5 | 3.1 | 2.0 | 3.8 |

Highest rate on wheat during 1891—4½c.
Average on wheat for season 1891—2.4c.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1892— | | | | | | | |
| Wheat | 1.9 | 1.8 | 2.0 | 2.3 | 2.3 | 2.3 | 2.6 |
| Corn | 1.7 | 1.6 | 1.8 | 2.1 | 2.1 | 2.1 | 2.3 |

Highest rate on wheat during 1892—3c.
Average on wheat for season 1893—2.2c.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1893— | | | | | | | |
| Wheat | 1.3 | 1.9 | 1.2 | 1.3 | 1.7 | 2.1 | 2.0 |
| Corn | 1.1 | 1.7 | 1.1 | 1.1 | 1.5 | 1.9 | 1.8 |

Highest rate on wheat during 1893—2 3-4c.
Average onwheat for season 1893—1.7c.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1894— | | | | | | | |
| Wheat | 1.4 | 1.2 | 0.9 | 1.0 | 1.4 | 1.1 | 1.8 |
| Corn | 1.2 | 1.1 | 0.9 | 0.9 | 1.3 | 1.0 | 1.0 |

Highest rate on wheat for season 1894—1.2c.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1895— | | | | | | | |
| Wheat | 1.2 | 1.2 | 1.0 | 1.6 | 2.1 | 3.1 | 2.8 |
| Corn | 1.1 | 1.1 | 1.0 | 1.4 | 1.9 | 2.9 | 2.5 |

Highest rate on wheat during 1895—4⅛c.
Average rate on wheat during 1895—1.9c.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1896— | | | | | | | |
| Wheat | 1.6 | 1.5 | 1.2 | 1.3 | 1.4 | 2.1 | 2.1 |
| Corn | 1.4 | 1.3 | 1.1 | 1.2 | 1.2 | 2.0 | 1.9 |

Highest rate of wheat on wheat during 1896—2⅝c.
Average rate on wheat during 1896—1.6c.
Duluth rates—1896—

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Wheat | 2.8 | 2.6 | 1.7 | 1.5 | 1.5 | 2.3 | 2.6 |

Highest rate during 1896—3c.
Lowest rate during 1896—1 1-4c.
Average rate during 1896—2.1c.

The range of wheat rates from Duluth to Buffalo in 1895 2@6c; 1894, 1 1-4@3c; 1893, 1 1-4@3 1-2c; 1892, 2 1-4@4c; 1891, 1 1-4@9 1-2c; 1890,2@5c; 1889, 2@5c; 1888, 2@5c; 1887, 5@8c; 1886, 3@8c; 1885, 1 1-2@5c.

## A SUCCESSFUL TUG BOAT LINE.

The Barry Bros.' Independent Tug Line, of Chicago, have been contemplating for some time of starting another tug line at Duluth, and have finally come to the conclusion that in the spring of 1897 they will be on hand to extend to their many friends their best endeavors, coupled with tugs second to none.

The history of the Barry Bros. has been one of progress. There are six brothers, all practical men, thoroughly understanding their business in its minutest details. Their onward march has been one of a steady and successful movement.

In the year 1870 Mr. John Barry arrived at Muskegon, Mich., and commenced to work on the boats of the Muskegon Boom Co., later on the balance of the brothers began to arrive, and, as they previously had been sailing on the Great Lakes, they followed their natural inclinations and also commenced work on the tug boats plying on Muskegon Lake. In the year 1879 they purchased the little tug Frank Geele, and launched out as tug owners. In 1881 another boat was added to their small beginning, but they were hard workers and successful; later on two more tugs were purchased. In the autumn of 1889 they saw that Muskegons chief industry, the lumber business, was fast becoming a matter of history and that they must seek some other outlet for their business. Chicago was finally decided upon and they immediately commenced operations, even though it was late in the year, bringing over their tugs, Commodore Jack Barry, (which tug, by the way, was named after their great grandfather, Commodore Jack Barry of the American Navy), and the tug John Miller.

Their small beginning was looked upon as if it was something of no moment, and by the consideration of their competitors, they were given from 60 to 90 days to remain in their chosen field, but they soon demonstrated that six brothers, all practical men, were not so easily pushed aside, and under all conditions of the hardest kind of competition, they, with the aid of their many friends, whose number increased daily, continued to expand, until today it is a well-known fact that they possess some of the most powerful and best tugs at Chicago.

## THE WEATHER MAN.

The present chief of the Weather Bureau began his profession in an observer's station twenty years ago. He came up from the ranks of the intelligent and industrious workers. In 1894, at a competitive examination, which had been instituted by the Secretary of Agriculture for a $2,500 professorship, it was decided, after a severe contest and examination by Professors Harrington and Mendenhall and Major H. H. C. Dunwoody, of the Signal Corps of the Regular Army of the United States, that Professor Willis S. Moore was entitled, by ability and requirements, to the place. Thereupon he was detailed to take charge of the weather bureau station at Chicago. He gave an entirely satisfactory and markedly useful service in that city. From there he was called to his present position as chief of the Weather Bureau Department of Agriculture. His success and promotion opens the way for advancement, through industry, skill, and attainments, to every observer in the Bureau.

## LAKE UNDERWRITING.

The Milwaukee Evening Wisconsin says Captain John V. Tuttle is at present inspecting vessel hulls at Buffalo, and will do likewise at all the lake ports when large vessels are laid up for the purpose of ascertaining their condition. The work is being done for the British and Foreign and North American syndicate, and will be condensed for information into a cipher code for private information only. Hitherto this company has taken very little hull insurance, confining itself to insuring cargoes. This new move may mean they are intending to bid heavily on hull insurance, or it may mean a limiting of risks to a certain number of approved boats. The outcome will be watched with interest.

## THE M. E. B. A.

George Uhler, National President of the Marine Engineers' Beneficial Association, will visit the lakes this week and address the marine engineers. Mr. Uhler, with Chief Enginer Melville of the U. S. Navy, was instrumental in securing the passage of an act of Congress which has been of much benefit to marine engineers and deck officers.

## For Sale

**The Steamer Allie E. Shipman.**

Forty gross tons. Dimensions—61 feet keel, 14 ft. 4 in. beam and 5 ft. 6 in. depth of hold, 12 square high-pressure engine. Scotch type boiler, allowed 125 pounds pressure. Boat built at Manitowoc in 1892. She is housed and licensed to carry 45 regular passengers. and has an excursion permit to carry 125 passengers.

Will sell or trade this boat for something larger. Now lying at Escanaba, Mich. For further particulars apply to

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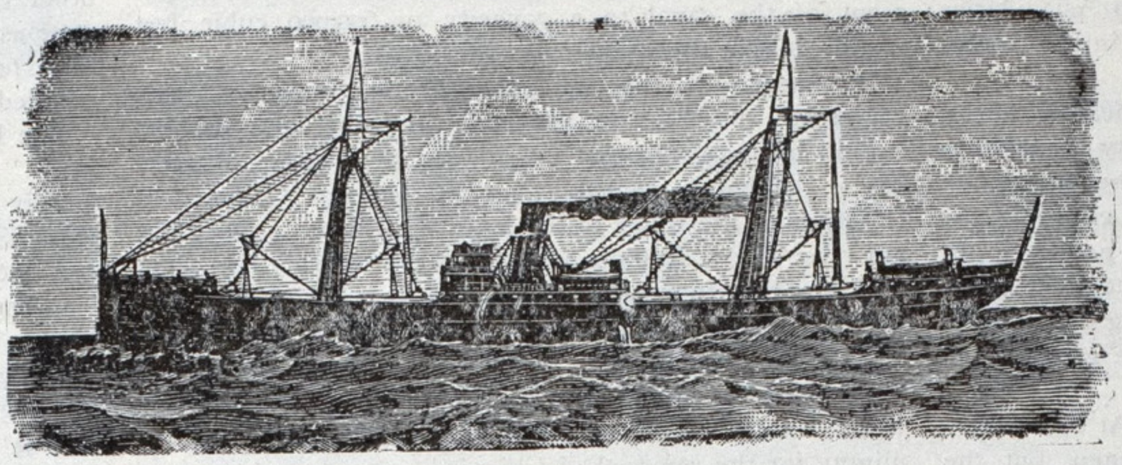

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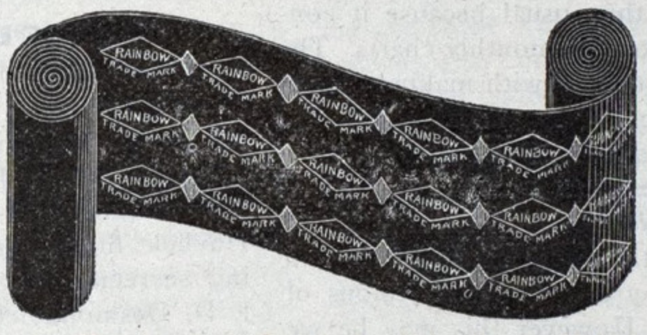


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### WEATHER BUREAU.

Our thanks are due to the Department of Agriculture for a copy of the year book of the United States. In a volume of nearly 700 pages the only article which we can find that would interest our readers is in part as follows:

"When it is considered that of the more than 3,300 meteorological stations in the United States at which observations are being taken and recorded, about 2,900, or nearly 90 per cent, are voluntary, it will be realized to what extent those interested in meteorology are indebted to voluntary observers for the material supplied for scientific research. Without the co-operation of voluntary observers, it would be wholly impracticable, with the data collected from the regular telegraphic stations of the Weather Bureau, to determine the local climatic features of the various sections of the country, which is being so thoroughly done through the extensive system of voluntary stations now in existence. The great increase in the number of voluntary meteorological stations during the past decade of years is due to the rapid extension of the State weather which are auxiliaries of the national Weather Bureau in the collection of meteorological data, the distribution of the daily weather forecasts and special warnings, and in service system, which now embraces the entire country in forty-two separate State weather service organizations, the collection and publication of local climatic and weather crop information through monthly meteorological reports and weekly weather crop bulletins.

For several years the national Weather Bureau has encouraged the establishment of voluntary meteorological stations by supplying to persons interested in meteorology an instrumental outfit, consisting of standard self-registering thermometers and rain gauges, a book of instruction to observers, and suitable blank forms for recording observations, upon condition that one observation shall be taken daily, preferably about sunset or thereafter, and that copies of records of observations made be supplied to the Weather Bureau through the State weather service, in whose territory the station is located. Owing to the limited supply of instruments available for distribution to voluntary observers, it has been necessary to impose certain restrictions in their issue in order that the instruments might be placed where observations would prove of the greatest value.

A trustworthy record of the weather is always of interest to any community, and is often of very great practical value. It is one of the objects of the Weather Bureau to foster and encourage the keeping of such records. There are numerous calls for records of the weather, as evidence in court in important cases, months and even years after the record is made. Contractors and others interested in outside work often want a record of days when there was rain or high winds, when streams were frozen over or swollen with floods, etc. Farmers are interested in the state of the season, whether forward or backward, as regards temperature and rainfall."

It would appear that the Weather Bureau, Department of Agriculture, is already overborne with observers, and we would recommend the lake marine fraternity to rather take up the hydrographic work of the Navy as being more in tone and consonance with the special results desired from their observations. We are strong believers in "color to color," or rather that similar interests make a conjunction for mutual benefit and such we recognize the Hydrographic department of the U. S. Navy to be in contradistinction to the Department of Agriculture, Weather Bureau.

We fully understand that "sailors are all more or less soldiers," but we fail to comprehend that there is any portion of them farmers, although there may be something of the plowing element about them.

In a word, what we desire to say is this: The Weather Bureau and the Department of Agriculture are clearly mismated, inasmuch so that we would advocate the branch hydrographic offices issuing daily reports of what concerns mariners, and the Department of Agriculture sending out information to farmers.

This severance of departmental work will, of course, not be consumated in a day, a week or a year, but eventually it will be brought about, and the law of the "survival of the fittest" be again duly recognized even in spite of present congressional enactments to the contrary.

Our present contention is a good deal like that of the Geodetic surveys and the United States Navy. The naval officers do the work and the geodetic surveyors, or heads of such, take over the credit. Another similie is the U. S. revenue cutters. Ships and men work under naval rules and carry similar power, but they are only under the Treasury department, and not in the arm of the government as symbolized by the U. S. Navy.

From the foregoing, our readers may judge that the U. S. Weather Bureau and Department of Agriculture are or might be somewhat at variance. One deals exclusively with the land and the other tries to tell us sometimes what may occur on the water. The advice given to farmers, and the counsel offered to sailors seem diametrically opposed to each other. Moreover, the conditions suitable for one, we might say, are generally obnoxious to the other. Hence, sailors may battle with the weather and farmers watch the temperatures.

### A WELL EARNED REST.

Mr. Byron Whitaker, senior member of the firm of B. Whitaker & Sons, insurance agents and vessel owners, Detroit, has retired from the business, after half a century of work. That is to say, he has so far given up work that he will only now employ his leisure in looking after his vessels. The firm will now be conducted under the name of Whitaker Bros., consisting of Charles and W. B. Whitaker, and if the sons are "chips of the old block," a prominent house must result, as the senior has had a most enviable business career with much less chances than furnished the new firm.

## PRESENT LEGISLATION.

Joint resolution to negotiate for modification of treaty of 1817 with Great Britain (see H. Res. 217.)

Commerce and Navigation. See also Finance and Commeree.

Bill providing for certain requirements for vessels propelled by gas, fluid, naphtha, or electric motors (see bill S. 1646).

Bills to amend laws relative to American seamen (see bills S. 2226; H. R. 6399).

Bills to amend laws relative to navigation (see bills S. 187; H. R. 2663).

Bill relative to tonnage tax on vessels (see bill H. R. 2672).

List of merchant vessels (H. R. Doc. 38).

Commissioner of Fish and Fisheries.

Annual reports of (H. R. Docs. 21, 104) 13, 15.

## MILWAUKEE YACHT CLUB.

The Milwaukee Yacht Club held its third annual meeting on Saturday night last, and elected the following board of directors: H. O. Coleman, C. J. Williams, John Joys, Jr., Zach Saveland, Alexander Mathes. The board elected H. O. Coleman commodore and president; Herman Falk, vice commodore and vice president; A. A. Hathaway, rear commodore and second vice president; Zach Saveland, secretary; John Joys, Jr., treasurer. H. A. Coleman was elected delegate-at-large for the club to the Lake Michigan Yachting Association.

## ASHTABULA WINTER MOORINGS.

There is quite a large fleet of vessels laid up at Ashtabula this winter, and as near as we can find out they run up as follows: German, Roman, Cumberland, Sir William Fairbairn, Chas. H. Bradley, Skater, John B. Lyon, A. P. Wright, Saxon, Jas. B. Neilson, P. P. Pratt; schooners, F. A. Georger, Moonlight, Verona, Pashtigo, Brightie, Mary Woolson, Martha, Malta, Manda, Annie M. Ash, Biwabic and George H. Corliss. Tugs, William D., Sunol, John Gordon, Fed Cloud, Kittie Downs, Marion, Reliable, Will & Harry, and Effie B., and the steam fueling scows Youghiogheny and Geo. B. Raser.

## SEMI-ANNUAL REPORT

Of the Wisconsin Marine & Fire Insurance Company Bank, made to the State Treasurer, January 4, 1897:

RESOURCES.

| | |
|---|---|
| Loans and Discounts | $1,024,913.02 |
| Bonds and Stocks | 178,678.12 |
| Real Estate | 584,820.40 |
| Cash on hand and in other banks | 518,474.19 |
| | $2,306,885.73 |

LIABILITIES.

| | |
|---|---|
| Capital | $500,000.00 |
| Undivided Profits | 75,328.79 |
| Due Depositors | 1,537,136.98 |
| Due to others | 194,419.96 |
| | $2,306,885.73 |

DIRECTORSS.—Edward P. Bacon, Washington Becker, Wm. H. Bradley, Alfred James, John Johnston, Sam'l. McCord, John L. Mitchell, Angus Smith.

## NOTES.

The Marine Record (Cleveland) has lost its printing plant by fire, but with creditable promptness has bobbed up serenely again as bright and chipper as ever—even brighter indeed.—New York Marine Journal.

The new Pintsch gas buoys placed on shoals in the St. Lawrence river during the past season have given good satisfaction, and it is now reported that five new ones will be placed next season. They are an excellent and economical aid to navigation.

The Minnesota Iron Company will mine 500,000 tons of ore on the Vermillion range and 400,000 tons on the Mesaba this winter. With the ore now in stock, the company will have 1,000,000 tons on the docks ready for shipment at the opening of navigaition.

Newly-elected officers of Detroit lodge Lake Shipmasters' Association are: President, A. J. McKay; vice-president, H. C. McCollum; second vice-president, William Roach; treasurer, Hiram Still; financial secretary, Robert Rhynas; recording secretary, J. W. Westcott.

Nearly £1,000,000 ($5,000,000), will be expended in extending the docks at Antwerp in order to meet the increasing demands of shipping at that port. The imports of the last decade have increased a couple of million tons annually and the minister of public works has decided to extend the quays 3,000 feet southwards and to make a channel 200 feet wide and twenty-four feet deep. The recent works were only part of a scheme for a still greater extension of the port.

Captain James F. Trowell, ex-harbor master at Milwaukee, has published his usual annual brochure of lake marine commerce at Milwaukee, a copy of which we have received with the Captain's hearty wishes for a prosperous and happy new year. The Record thanks Captain Trowell for his courtesy, and in returning the compliments of the season we hope he wil be spareo to send us at least as many more annuals in the future as he has in the past.

Persons who say that technical papers are dry reading must be hard to please. This is the way our esteemed contemporary, The Marine Journal, which Captain George L. Norton edits, leads up to a notice of a calendar: "One of the prettiest picture of a sweet maiden of about 18 summers, clad in charming costume and listening to the music of the pines in a shady grove, is that which adorns the '97 calendar, etc., etc. Captain! Captain!—The Engineer, New York.

A consolidation, or combination of interests between the Joint Traffic Association, chiefly composed of railroad interests, and the lake line people, is likely to eventuate this winter. This week the freight and passenger agents of several lake lines are attending a meeting of the Traffic Association in New York and we look to see a concerted arrangement entered into with the trunk lines, which will redound towards making charges for both Eastern and Western shipments somewhat lighter than heretofore.

The New York Maritime Register comes to hand in a new dress, and the proprietors of this reliable and well-established journal announce that they will make other improvements and shortly give subscribers the best maritime paper in the world. The Weekly Shipping Record, notice of which was given in these columns a few weeks ago as an offshoot from the Register, has been consolidated with the Register, and the entire staff of both papers are now working for the honor and glory of the journal which can be found in every seaport on the globe.


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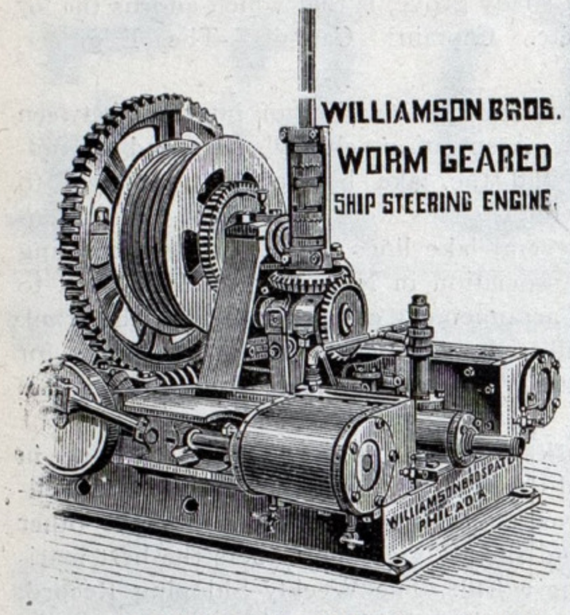


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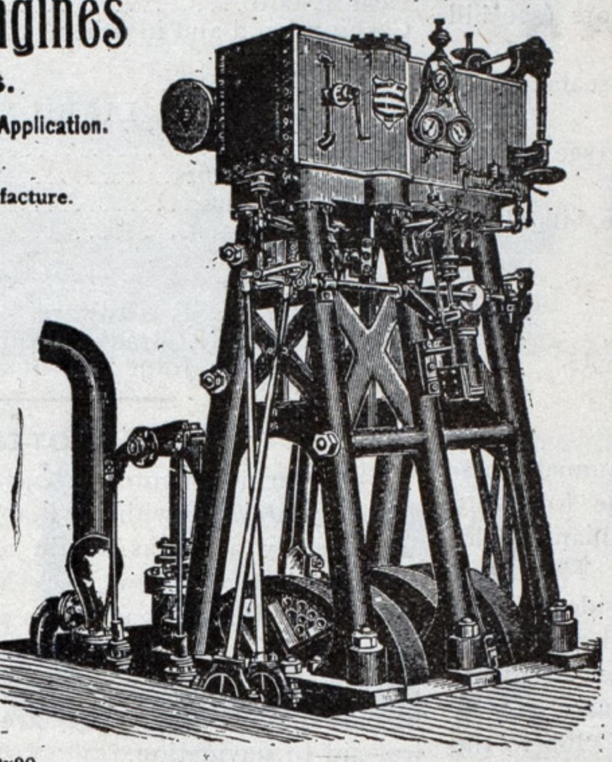

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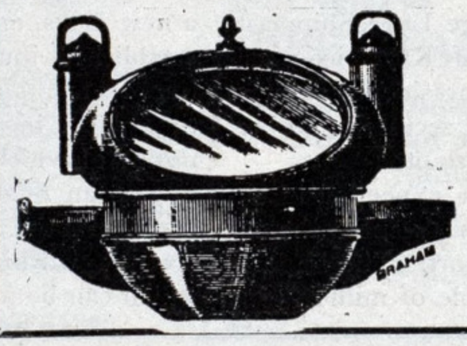


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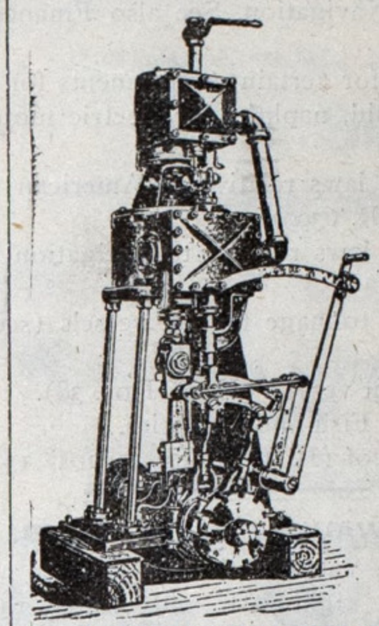

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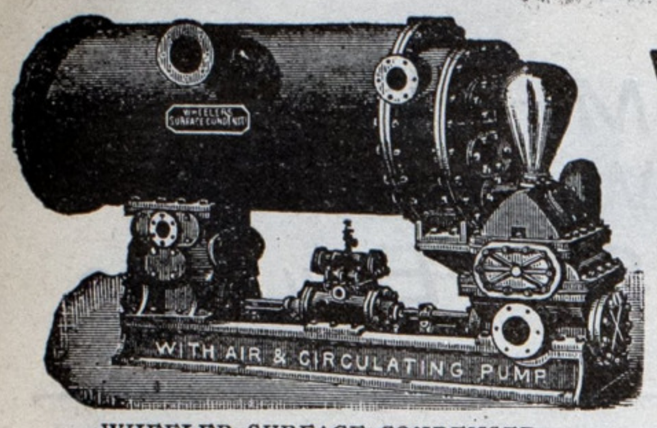


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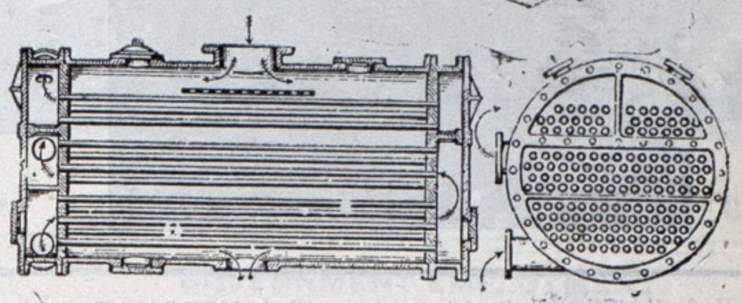

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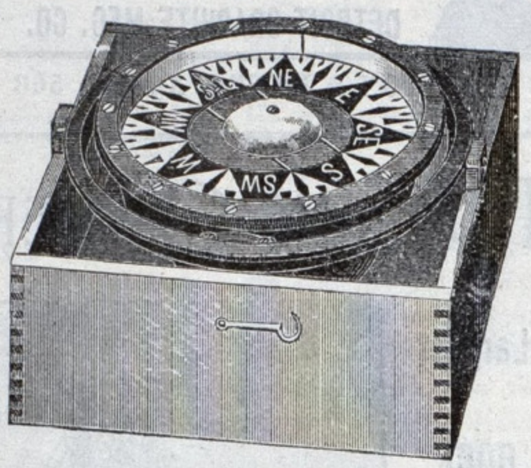

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U. S. Engineer Office, Duluth, Minn., Dec. 16, 1896. Sealed proposals for dredging about 21,000,000 cubic yards in the harbor of Duluth, Minn., and Superior, Wis., will be received here until noon, Feb. 15, 1897, and then publicly opened. Information furnished on application. Clinton B. Sears, Major Engrs. 52-6

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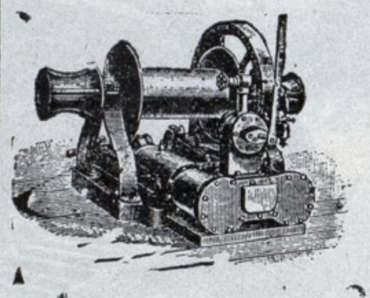

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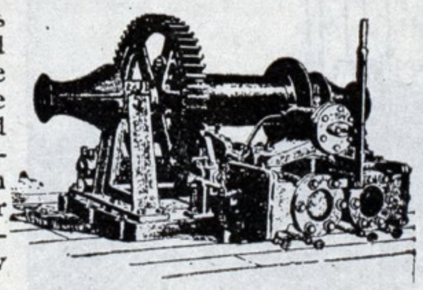

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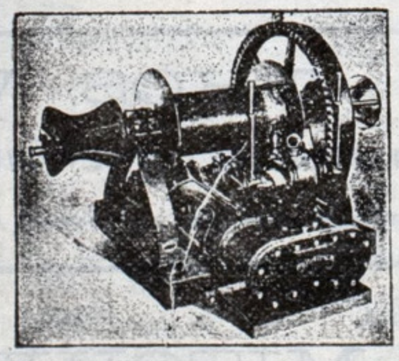

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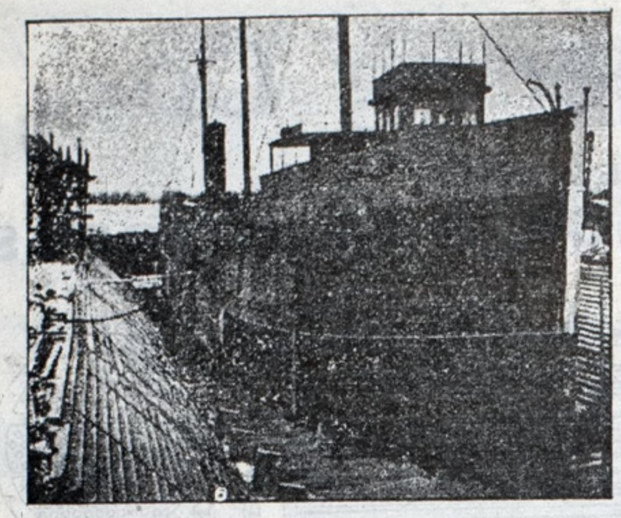

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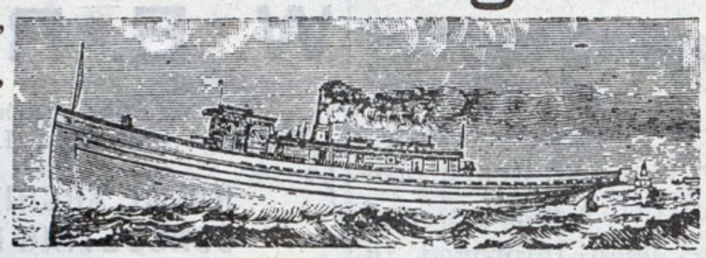

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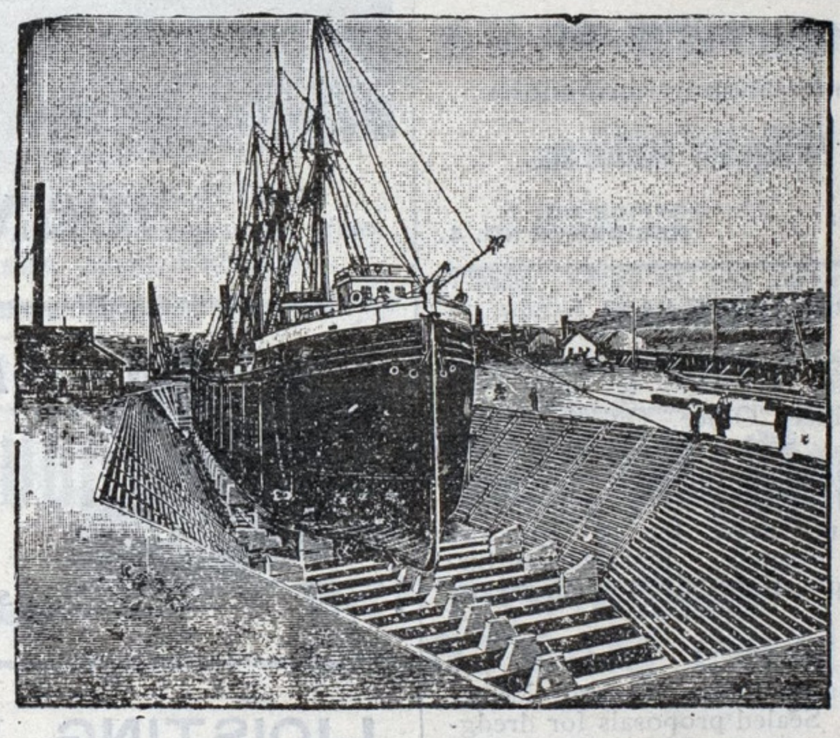

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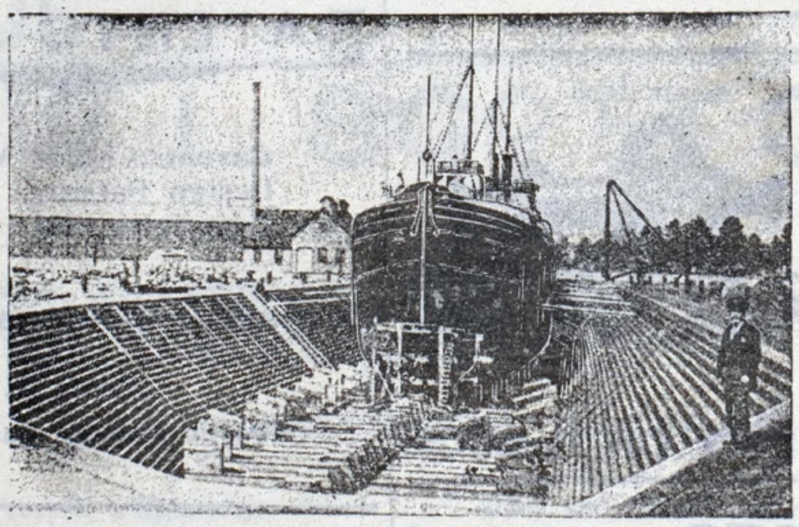

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